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The Garden Journal

of The New York Botanical Garden

3, No. 2 Mar.-Apr., 1953

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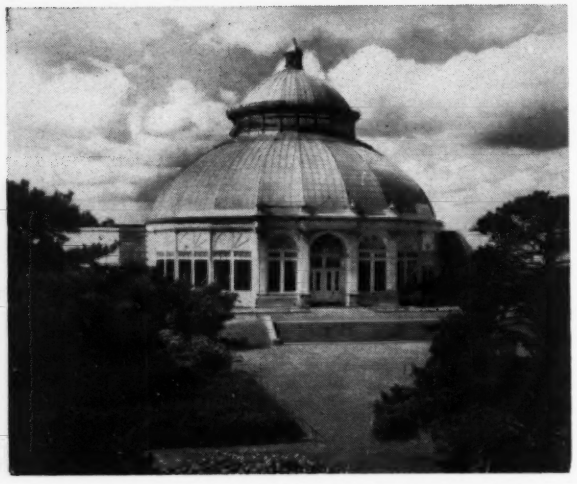

It is expected, at the time of writing, that the Conservatory, which has been undergoing extensive renovation since last fall, will be open to the public for the Easter Show. The tentative dates for the show are March 27-April 12.

DOROTHY EBEL HANSELL
Editor

THE GARDEN JOURNAL
of The New York Botanical Garden

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CREDIT FOR ILLUSTRATIONS

Front cover, colored illustration of the 1952 Spring Show in the Conservatory of The New York Botanical Garden, by Earle Dugan; p. 34, Gottscho-Schleisner — courtesy of the Henry Francis du Pont Winterthur Museum; p. 35, Gottscho-Schleisner; pp. 36, 37, Robert C. Frampton — courtesy Rancho Santa Ana Botanic Garden; pp. 38, 39, N. Y. State Dept. of Conservation; pp. 40, 41, The New York Botanical Garden; p. 42, E. N. Mitchell; p. 43, courtesy of "The Begonian"; p. 45, courtesy of Monsanto Chemical Co.; pp. 46, 47 — courtesy of the author; p. 48, J. Horace McFarland; p. 49, courtesy of Farr Nursery Co.; p. 50, R. Wallace and Co., Ltd.; pp. 51, 52, The New York Botanical Garden; p. 56, Robert A. Wesselmann — courtesy of N. Y. State Agric. Exp. Sta.; p. 58, from the painting by Edith F. Johnston; pp. 63, 64, E. N. Mitchell; p. 65, Edward Gottlieb & Associates, Ltd.; back cover, daffodil time at The New York Botanical Garden, Gottscho-Schleisner.

AMONG OUR CONTRIBUTORS

HENRY T. SKINNER was Curator of The Morris Arboretum, a post he held for ten years, when he wrote the article, "Toward Hardiness in Azaleas." Dr. Skinner is now Curator of the National Arboretum, having assumed his new responsibilities on September 1, 1952. . . . PHILIP A. MUNZ has been instrumental in building a formidable teaching and research center in systematic botany at Claremont College by engineering the move of the Rancho Santa Ana Botanic Garden to Claremont, California. The combined staff of the Garden and the Departments of Botany of the Associated Colleges are now offering work for the degree of Ph.D., and have one of the most modern herbarium installations in the country. . . . E. W. LITTLEFIELD is Superintendent of Forest Management in the New York State Conservation Department, with which he has been associated since 1923, first in research activities connected with forest pathology and reforestation, and more recently as supervisor of the State's program of technical assistance to private woodland owners under the Forest Practice Act. Mr. Littlefield has also been an active contributor to "The New York State Conservationist" and was the author, about a year ago, of the article which attempted to answer the question, "If our objective is the preservation of our forests, are forests best preserved by prohibiting cutting?" . . . T. H. EVERETT is Horticulturist of The New York Botanical Garden. . . . Begonias are part of the every-day living of ELSA FORT. Not only does she grow them in large numbers at her home in New Jersey, but she is a successful exhibitor and serves as Eastern Chairman of Public Relations of the American Begonia Society. Mrs. Fort also finds time to write and lecture on herbs. . . . P. P. PIRONE is Plant Pathologist of The New York Botanical Garden. . . . How many of its present five thousand members are aware that the American Iris Society was started largely through the initiative of one man, JOHN C. WISTER, now Director of the Arthur Hoyt Scott Horticultural Foundation at Swarthmore College? Mr. Wister received enthusiastic response from people abroad as well as in this country, and with the cooperation of Dr. H. A. Gleason, then Curator of The New York Botanical Garden, and Frank Presby of Montclair, N. J., arranged a meeting at the Garden in January 1920, out of which the very active American Iris Society developed. . . . CAROLINE DORMON is widely known not only in the Deep South where she lives, but throughout the country for her gardening activities. Miss Dorman has been a contributor to many magazines for a period of thirty years. Her "big accomplishment" is her book, WILD FLOWERS OF LOUISIANA, for which she also painted the illustrations. She has waged a constant, if losing, fight to preserve Louisiana's vanishing native flora. . . . MARGARET P. SLAUGHTER is an ardent gardener, member of the Garden Club of Houston and actively identified with the very successful Bulb Mart which has been held in that Texas city for the past ten years. She was also the prime mover in organizing and is president of the Spuria Iris Society, subsection of the American Iris Society, which came into being on May 27, 1952. One of Mrs. Slaughter's fondest dreams is now materializing — an iris test garden in Houston. . . . DREW SHERRARD for a good many years has combined two interests, plants and writing. At present, she is special garden editor on the staff of "Farm Home Garden" of the "Portland Oregonian." . . . DR. A. B. STOUT is Curator Emeritus of The New York Botanical Garden. . . . While a resident of Florida, EDITH F. JOHNSTON made a study of tropical and subtropical plants and more than one hundred paintings and sketches. She is well known to nature lovers as author and artist. . . . GERTRUDE B. FOSTER is editor of "The Herb Grower Magazine."

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Toward Hardiness in Azaleas

By **Henry T. Skinner**

In azaleas for the vicinity of New York and Philadelphia, the matter of hardiness is a recurring problem. While it is true that numerous fine plantings are to be seen in the northeastern states, the diversity of this material can scarcely compare with that of the famous gardens of Washington to Norfolk, Virginia, and southwards to the Gulf Coast.

The principal azaleas of these southern gardens are the so-called "Indian Azaleas," which were imported from Belgium, Holland, and England during the last century, where they had been bred or selected from such Chinese and Japanese species as *Rhododendron indicum, mucronatum, Simsii, phoeniceum,* and others — all species which are notably winter-tender in our own northern region. In more recent years, the southern azalea gardens have been further enriched by addition of the many named varieties of the more compact growing and smaller-flowered Kurume azaleas, together with a few later hybrids of "Indian" type. The Kurume azaleas are essentially selections from *R. kiusianum,* which were made some one hundred twenty years ago in the relatively mild climate of Kurume, Japan; and, while many of them may be seen finely displayed at Winterthur, Delaware, and in a few other northern plantings, in general they must be considered a tender race for our region. The familiar little red "Hinodigiri," white-flowered "Snow," and a few others are the only ones which withstand a normal winter in New York City without excessive flower bud loss.

Azaleas for northern gardens must rely for their hardiness (which is, in large measure, the ability of their flower buds to become sufficiently tough and well ripened by the time of the first frosts in fall) upon species of more northerly or higher altitude occurrence than the progenitors of the types just mentioned. Fortunately, several such species exist and some of them have already been used to produce a fair selection of azaleas suitable for our region.

Akin to the Kurume azaleas and also from Japan is relatively tall-growing, brick-red to pink-flowered *R. Kaempferi,* which is entirely hardy in Boston and up-state New York. Hybridizing, as it does, with both Kurume and Indian types, elements of this species have already been incorporated in several hardy named hybrids; it will undoubtedly continue to receive much attention as a prospective parent of hardier races. The magenta-flowered Korean azalea, *R. yedoense* var. *poukhanense* is in a similar category, possessing the ability to impart hardiness in crossings with the more tender types.

The asiatic Subseries Schlippenbachii contains several azaleas which are excellent for our region — from *Rhododendron Schlippenbachii* itself, the beautiful Royal azalea, to pink-flowered *Weyrichii, Mariesii, quinquefolium,* and *reticulatum,* none of which has so far received much attention from the hybridization standpoint. But they may be somewhat resistant to the process.

In the related Subseries Canadense, our native and very satisfactory *R. Vaseyi* has an also promising hardy Japanese cousin in *R. Albrechtii.* But from the hardiness standpoint, as probably essentially also for decorative value, the azaleas of Subseries Luteum are outstanding. Included in this subseries are the only azaleas with yellow-flower coloring — the large-flowered yellow to orange *R. molle* and *japonicum* from the Orient, the clear yellow Pontic azalea, *R. flavum,* from the Caucasus of eastern Europe, together with the sixteen or seventeen American species which range in color from pure white to pink, yellow, orange, and deep red. Some of the native azaleas are in our gardens, and hybrids of them made many years ago with *R. molle, japonicum,* and *flavum* have been with us as the well-known "Mollis" and "Ghent" azaleas. It seems strange that the good influences of the native species, as displayed in the Ghent hybrids, should have passed relatively unnoticed by later hybridizers until almost the present time.

Here, then, are some of the desirably hardy species suitable as building materials for better northern hybrids. What progress in their utilization can be reported to date?

Since introduction to this country of the main groups of Indian, Kurume, Ghent, and Mollis azaleas, a considerable amount of hybridization has been done and numerous new names have appeared in the texts and nursery catalogs. Perhaps most of these fall in the Kurume-Kaempferi classes, but there have been others more strictly of "Indian" type and quite recently an

influx, from English origins, of new large-flowered types akin to Ghents. Of that which has been seriously tried, the great bulk of this material shows little promise for use in the vicinity of New York. It is far too tender. There are many groups, however, which have not yet been adequately tested and from which a few good plants at least may be expected. It is of interest that the New Jersey Nurserymen's Association is sponsoring a project devoted to a rigorous testing of all azalea varieties for hardiness and horticultural desirability. The Morris Arboretum in Philadelphia is cooperating in this program and has actually had several hundred such varieties under observation for the past two or three years. While it is as yet too early for authoritative judgments, present remarks are based largely upon these tests at the Morris Arboretum.

For those interested in the older Kurumes, it would appear as of this writing that the clones "amoena," "amoena coccinea," "Bene-giri," "Cherry Blossom," "Christmas Cheer," "Hinocrimson," "Hinodigiri," "Hinomayo," "Hinomayo fl. pl.," "Snow," and "Sweet Briar" can be definitely counted among the hardiest of the strain.

Allied to the Kurumes are the Arnold Hybrids, a small group of named forms including "Mello-Glo," "Briarcliffe," and "Mossieanum," which were developed some forty years ago at the Arnold Arboretum from a cross between *amoenum* and *Kaempferi*. While several of these are commercially available and can be well recommended for hardiness, their fuchsia-violet color unfortunately leaves much to be desired.

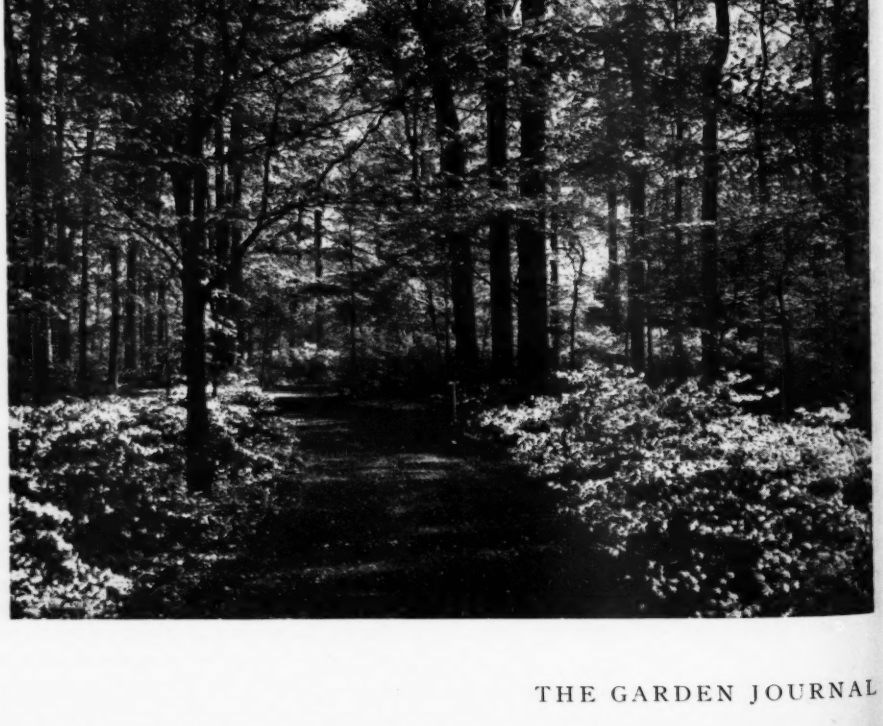
The first main batch of hybrids involving hardy *R. Kaempferi* in conjunction with the Kurumes originated some years ago at Koster Nurseries in Bridgeton, New Jersey, and the same cross has been latterly employed by several hybridizers. While seldom as hardy as *Kaempferi* itself, the following clones of this series have seemed promising in the Philadelphia region and may well be worthy of trial a little farther north: "Alice," "Fedora," "Kathleen," "Martha," "Mary," and "Othello." Of the long list of names now recognized, it is likely that further testing will bring several others to the fore on a hardiness basis. Of quite recent introduction, other Kaempferi hybrids do, in fact, show promise, especially in a few of the Chisholm-Merritt hybrids (introduced in 1947) such as "Asia," "Augusta Brez," "Charlotte Weiss," "Cornelia," "Fascination," "Mackey Chisholm," "Ohio," "Pink Lady" and "Potomac." The Deerfield hybrids, which were introduced from New Jersey at the Philadelphia Flower Show in 1950, are reportedly hardier than the average Kurume azalea, and such clones as "Pink Progress" and "Red Progress," introductions of Rhodo-Lake Nurseries in 1948, have certainly given very good performance as improvements on familiar "Hinodigiri."

The Vuyk or Vuykiana hybrids comprise a group of about ten larger-flowered azaleas (with several musician's names) which have come from Holland in quite recent years. *R. Kaempferi* figures in the parentage of this group and the varieties "Gerardine Vuyk," "Helena Vuyk," "Beethoven," "Joseph Haydn" and "Wilhelmina Vuyk" (a good white) have flowered well with little bud loss in Philadelphia.

Full credit, however, for some of the hardiest of all the hybrids of recent introduction must go to Joseph Gable of Stewartstown, Pennsylvania, who has used hardy *R. poukhanense* as well as *Kaempferi* in combination with Kurumes, *mucronatum*, and other strains. While many are worthy of trial in our region, the varieties "Claret," "Ethelwyn," "Herbert," "Louise Gable," and Gable's double and pink-flowered "Rosebud" can be recommended. The Gable hybrids in their general color range of lavender to pink and red with some good clear whites are now fairly readily available in the nursery trade under the names given by Mr. Gable and others or, not infrequently, still under their introduction numbers.

Still in the Obtusum Subseries, attention is called to a large and very recently introduced group of azaleas — the Glenn Dale hybrids. The four hundred and fifty-four clones already named in this group represent the partial products of a very extensive breeding program conducted by B. Y. Morrison in Washington, D. C., utilizing Kurumes, Kaempferi hybrids, *mucronatum, indicum,* and, to some extent, *poukhanense*. Here we have essentially a totally remade set of obtusum types with generally much larger flowers than in the Kurumes, with a blooming season continuous from April to June.

While there are many beautiful flowers found within this group and while at least a fair number of these



The Henry Francis du Pont Winterthur Museum at Winterthur, Delaware, is famous for its magnificent collections of azaleas in natural settings

In May, the grounds of The New York Botanical Garden are aglow with azaleas

hybrids are expected to prove their hardiness in the New York region, it is unfortunately too soon to say definitely which are these hardier clones. Of the earlier distributions, however, and on a basis of two seasons' observation, the following have shown especial promise in Philadelphia: "Alabaster," "Buccaneer," "Carmel," "Elizabeth," "Festive," "Geisha," "Glacier," "Robin Hood," and "Souvenir." With good performance, though slightly less bud hardy, are "Anchorite," "Bishop," "Cytherea," "Rosette," "Samite," "Treasure" and "Violetta." Opposed to these selections are some forty varieties which, in their younger stages, have seemed unmistakably tender. This is a group to be watched closely during the next few years.

For the benefit of those familiar with the magnificent hillside azalea display at the National Arboretum, it is interesting to note that the thousands of plants forming this color spectacle are in reality among the discards of the Glenn Dale selections. Even here many individual clones are quite remarkable by earlier standards.

Finally, perhaps no comments regarding azaleas of recent introduction are complete without mention of the much discussed Knaphill hybrids, including the Exbury, Slocock, and Ilam strains. Of English origin, these azaleas fall essentially into the classification of improved Ghents. They are large-flowered and embrace the salmon-yellow-orange color range rather than the pink-reds of the Obtusums. Their parentage stems from the older Ghent gene mixture of *R. molle, japonicum,* and *flavum* with additions of American species such as *viscosum* and *arborescens,* to which later influence of western American *occidentale* has evidently been incorporated. By published descriptions these are fine azaleas, but testing has only commenced within our area so that performance is as yet a question mark. It is likely, however, that some of these at least should make successful additions to our gardens.

In the latter group, the Exbury hybrids, the prediction of probable hardiness for individuals of this group is based quite largely upon the fact that hardy American species have played a part (however limited) in their development. Future attention will undoubtedly be focused more and more upon the utilization of our native species for the really sturdy azalea races of the future. Several breeders could already be named whose sights are beginning to turn in this direction, and a fairly comprehensive program devoted to the ultimate breeding and selection of new races of azaleas from building materials among the native species has been under way for a year or two at the Morris Arboretum in Philadelphia.

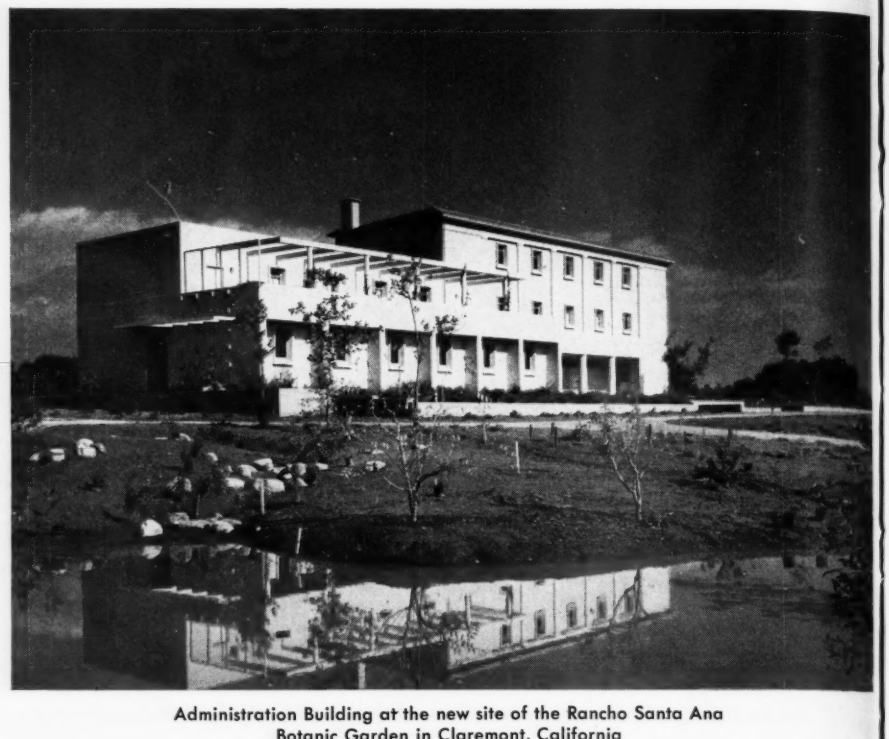
A twenty-five thousand mile field collecting trip was started from the Morris Arboretum in 1951 to study the characters, habits, growth preferences, and geographic distributions of the eastern American wild azaleas. Besides a host of herbarium specimens, this expedition yielded several hundreds of living plants, some of them with valuable prospects from the horticultural standpoint, to be used for a scientific study of their wild types, as well as a basis for a special breeding program. Many crosses were made during the past season, and it is hoped that new races may eventually result in which characters as dwarf or tall habit, stoloniferous root system, fine color range, ability to be propagated by cuttings, and especially hardiness can be emphasized at will in a way which the almost sole usage of exotic species has never heretofore permitted. This particular program, however, will still ring in the exotics where usefulness can be served. It has long been felt, for instance, that *R. japonicum* especially has the excellent qualities of flower size, sturdiness, soil range tolerance, and hardiness which could well be combined with some or all of the characters of the natives mentioned above. In anticipation of this, work has been under way at the Morris Arboretum for several years in improving *R. japonicum* by the methods which have been so successfully applied in the production of hybrid corn — the development of hybrid vigor by the interbreeding of selected lines which have been self-pollinated for several generations. From present indications, the results of such efforts will be no less spectacular with the azaleas.

Hardiness is a very essential character to be possessed by all azaleas for our northern gardens. Fortunately, there now seems every prospect that within a relatively short time we may at last have a real selection of hardy forms without sacrifice of those other important qualities of over-all beauty and availability.

For color descriptions of most of the clones mentioned, the reader is referred to *The Azalea Handbook*, published by the American Horticultural Society, January, 1952. *The Editor.*

RANCHO SANTA ANA BOTANIC GARDEN

By **Philip A. Munz**



Administration Building at the new site of the Rancho Santa Ana Botanic Garden in Claremont, California

FOUNDED in 1927 by Susanna Bixby Bryant in memory of her father, John W. Bixby, the Rancho Santa Ana Botanic Garden was created for the study of the native plants of California. Its program has involved botanical and horticultural investigation, dissemination of knowledge concerning the plants of the state, and assembling and growing such plants. Originally established on Mrs. Bryant's ranch in the Santa Ana River Canyon in Orange County, it was moved early in 1952 to Claremont, California, in order to be more accessible to the general public and to have affiliation with the Associated Colleges in Claremont. This move has meant a period of inability to exhibit plants to the public and the loss of many years of work and of plant growth, as well as a very considerable expense, but the new site promises to be very much more suitable for a botanical garden, with more favorable soil and water.

The Garden possesses a tract of eighty acres, part of which is on a low mesa of clay loam, part in a gravelly wash, and part in rather sandy loam, so that a variety of conditions exist. Situated about thirty-five miles from the Coast, Claremont is in the center of a citrus-growing region, has rather mild winters and fairly hot summers, but not the extremes of farther inland. The elevation of twelve hundred feet and the frequent summer fogs mean cool nights. With sufficient water, northern coastal species, such as the redwood, thrive, as do montane plants from as high as Yellow Pine Forest. On the other hand, the days are sufficiently dry and warm so that desert plants also do well, particularly in well-drained soil.

To prepare the new site for occupation a chain link fence was erected, the area was surveyed into a numbered one hundred-foot grid for planting records, and pipe lines were laid along the grid divisions. Thus not only is every square of the grid numbered, but it has water available for irrigation. A fine fringe of the native oak *(Quercus agrifolia)* along the east slope of the mesa furnishes protection and concealment for a nursery and shade for many species from the cool parts of the state. A modern nursery was erected with greenhouses, potting shed, metal-lath house, seed-storage house, a screened glass-roofed house for annuals, tool and work rooms, garages, and nurseryman's cottage. On the mesa and adjacent to the nursery is a test plot of some acres for experimental work. At the south end of the mesa and overlooking town and valley and with views of the Santa Ana Mountains to the south, the San Bernardino and San Jacinto Mountains to the east, and the San Gabriel Mountains to the immediate north, stands the administration building, erected at a cost of a quarter of a million dollars. Fireproof in construction, this building is in part two stories and in part three stories high. It contains offices, laboratories for research and graduate teaching, work rooms, the library, and herbarium rooms. It is planned so that new wings can be added at both ends. A parking area and the main entrance to the Garden are just to the south of the building.

The library consists of the Garden library and special research items from the botanical library of Pomona College, a total at present of about thirteen thousand volumes. These deal primarily with botany and horticulture, but include also about one thousand volumes of Californiana, such as reports on early exploring expeditions. The collection is rich in monographs, floras, and journals and is being enlarged rapidly. At present about two hundred twenty-five journals or serial publications are obtained. Others are available at the Honnold Library of the Associated Colleges.

The herbarium consists of the Pomona College collection of over three hundred thousand sheets and the Garden herbarium of about ninety thousand. Special collections are the herbaria of C. F. Baker, M. E. Jones, Frank W. Peirson, P. A. Munz, Lyman Benson, and Carl B. Wolf. As yet the herbaria of the College and the Garden are housed in separate cases, but it is expected that ultimately they may be brought together.

By arrangement with Claremont College, each member of the scientific staff of the Garden offers a graduate course each semester in the Claremont Graduate School, so that he has academic status in that school and cooperates with other botanists of the Associated Colleges in a graduate program. The degrees of Master of Arts and Doctor of Philosophy are being offered, particularly in the fields of descriptive and experimental systematics, cytogenetics, plant breeding, and mycology.

At present the Garden employs about twenty persons: four research men, a secretary and curator, a part-time librarian, a superintendent, a horticulturist, a nurseryman and laborers. It offers also a number of graduate assistantships for part-time work and with a stipend of $1200.

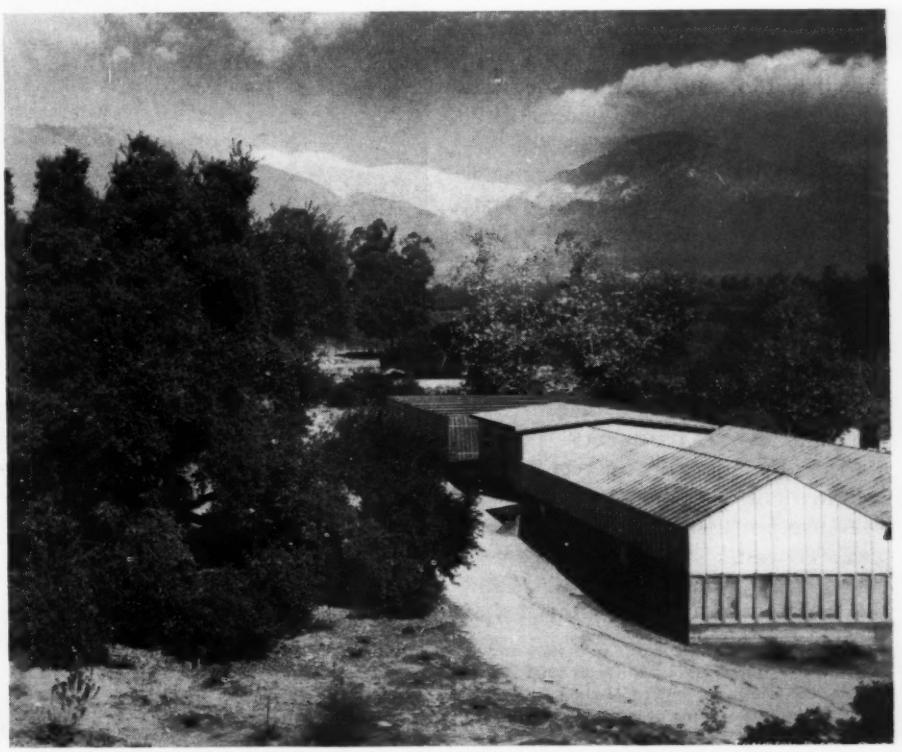
The Garden property has been laid out by landscape architects and is being developed in accordance with their plan. The area in the neighborhood of the administration building and nursery will have special gardens (such as bulb, shade, succulent, desert, trickle), specimen trees and shrubs, demonstrations of groundcovers, hedges, and the like. This is the area for the casual visitor. Beyond that lies the experiment or test plot. Then the larger acreage to the north is being planted according to a system of Plant Communities, to which reference is made farther on in this paper. Here there is slowly being developed, in miniature and so far as is possible in one climate and a given set of conditions, the woody vegetation of the state. Many thousand plants have already been set out from the nursery, and with the long growing season of southern California rapid development can be expected. However, it will be some years before they are large enough to give any indication of what each Community is like and before they furnish shade and protection for the undergrowth that will eventually be established for the Community. It is expected that in this fifty-odd acres a student will in years to come be able to get a notion of California vegetation that cannot be obtained by simply seeing specimen plants and that would require many miles of travel in the field.

The research activity of the Garden now lies in several directions. Dr. Lee W. Lenz is doing breeding work on many groups of plants to produce better forms for garden use. In recent years interest in California in the use of native plants as ornamentals has greatly increased. In western Europe, with its cool nights like those on our Pacific Coast, many of our western species have been much cultivated since the time of David Douglas, and innumerable horticultural forms have been produced. California has many beautiful and exciting plants in its flora, some of which can be used to good advantage as they are, but some are too leggy for the average small garden. Others do not do well in and about lawns, since they are accustomed to summer dormancy and easily rot with too frequent irrigation when the soil is warm. Not only does breeding offer great possibility in the production of new color forms and types, but often compactness in habit and other improvements can be made. Sometimes hybridization with related species from regions with summer rain results in combinations with greater tolerance of irrigation. With these considerations in mind, one can see the type of problem facing the plant breeder. Dr. Lenz's work so far has been chiefly with *Iris, Fragaria, Ceanothus, Penstemon, Heuchera,* and *Dudleya,* and his first products are being released to the nursery trade this winter. At the same time, as he is carrying on this breeding program, he is doing fundamental research on the genetics, cytology, and systematics of some of these groups. He has almost ready for the press a book for the average gardener on many of the more important California natives and their propagation and culture.

Dr. Verne Grant has been continuing studies begun some years ago at the University of California on the phylogeny of the Polemoniaceae. His work on *Gilia* and related genera involves both North and South American species and requires field and garden studies, hybridization, cytology, and selection. He is interested also in the relation between various western flowers and their pollinators and is accumulating considerable data in this field and on the whole question of mechanisms and methods of evolution.

Dr. Richard Benjamin has recently joined the Garden staff for work in mycology and lower plant groups. His doctoral thesis was done at the University of Illinois on the Laboulbeniales, then he spent a year at Harvard

(Continued on page 44)



Greenhouses and lath house, with San Gabriel Mountains in the background

The Forest Preserve Controversy

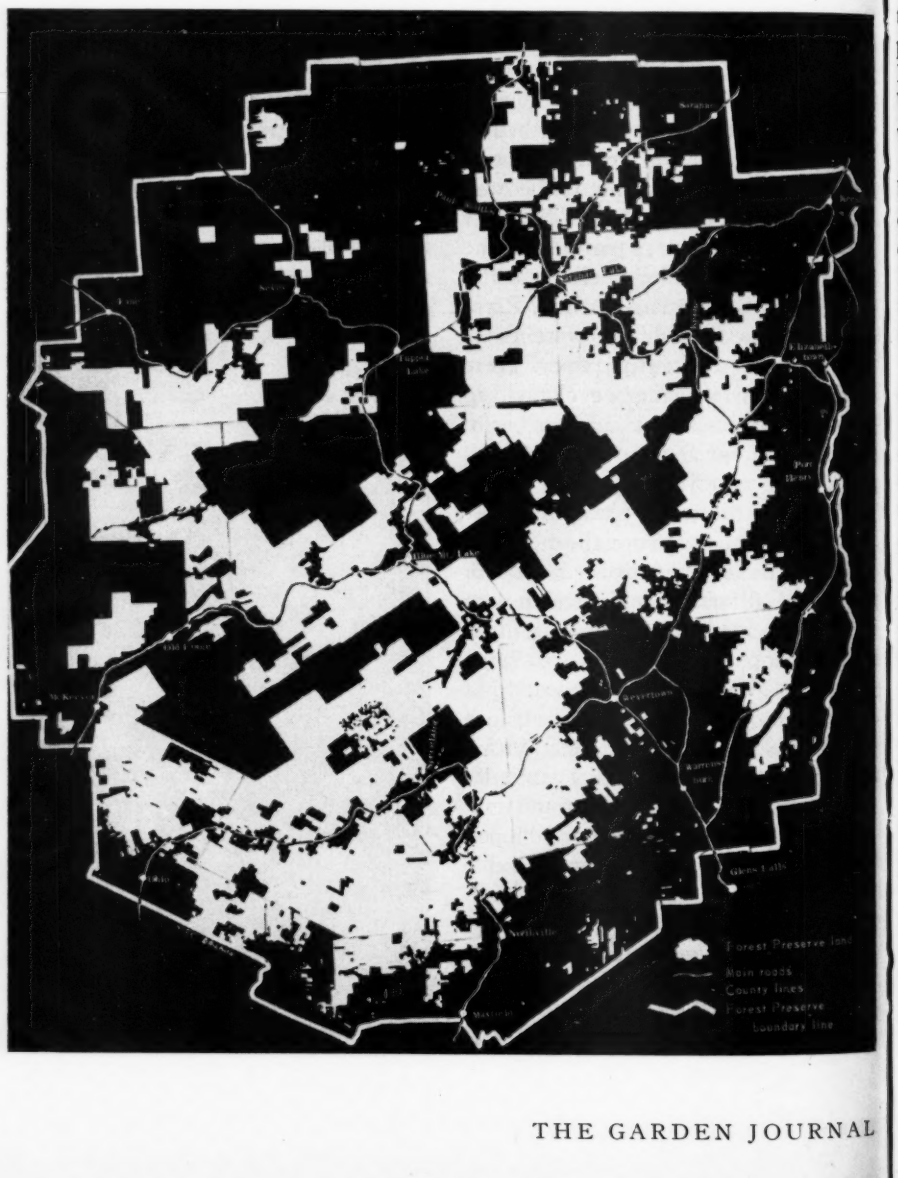
By **E. W. Littlefield**

UP IN the hinterlands of the Adirondacks and Catskills lies a jealously-guarded empire, made up of some two and a half million acres constituting the State Forest Preserve. These are defined in the Conservation Law as "the lands owned or hereafter acquired by the state" (with certain exceptions) within the twelve Forest Preserve counties, north of the Mohawk, together with Greene, Ulster, Sullivan, and Delaware counties in the Catskills. "They shall," says Article XIV, Section 1 of the State Constitution, "be forever kept as wild forest lands. They shall not be leased, sold or exchanged, or taken by any corporation, public or private, nor shall the timber thereon be sold, removed or destroyed."

In the six decades since this constitutional prohibition became effective, differences of opinion have developed between that part of public opinion which has been insistent on keeping the Preserve inviolate and those who have clamored for modification or revision of the Constitution to permit the cutting of timber under regulations which would, they believe, safeguard the timber and water resources of the region.

From time to time, the bars have been let down a little to enable state administrative officers to give the Preserve adequate protection or in response to public pressure for state roads or the development of recreational facilities. But, as an article in the "New York State Conservationist" (the official publication of the State Conservation Department) pointed out recently, "Actually the recreational facilities now available on the Forest Preserve are there mainly by sufferance. To justify their development, a half-century of opinions by Courts and Attorneys-General shows that many men have had to bend far over backward to meet growing needs." . . . "Furthermore, the specific prohibition against the cutting of trees and the directive to maintain the lands forever wild, if literally observed, obviously rule out the clearing of land for campsites and trails and the taming of the landscape with a leanto." And, it might be added, such a literal interpretation would similarly prevent the construction and maintenance of fire observation towers and telephone lines, so vital to the very existence of the Forest Preserve. Most of these activities were initiated and are being carried on today under opinions handed down, as stated, by various Attorneys-General. Exceptions are the construction of state roads and the ski centers at Whiteface and Belleayre Mountains, which are provided for by constitutional amendment.

In order to have an intelligent understanding of what the Forest Preserve means, several basic facts about it must be recognized at the start. *First,* not all the land inside the "Adirondack Park" is Forest Preserve; in



This is the Adirondack Park, with state-owned (Forest Preserve) lands in solid black. Note the "shotgun" pattern of state ownership and the large areas of private land (white) in between or surrounding the state parcels.

This picture, taken from top of the Pinnacle, shows left to right (beginning at tree) Basin, Table Top, Saddle Back, Gothics, Sawtooth

fact, not more than forty percent. *Conversely*, not all the Forest Preserve lands are in the Park, but may be located anywhere within the limits of the sixteen Forest Preserve counties. Furthermore, the state-owned lands in the Adirondacks and Catskills are not necessarily "wild" just because they are called Forest Preserve. Some of them are old farms or waste lands that the State was obliged to take over in the days when, by law, tax delinquent property reverted to the State instead of to the counties, as it does now. Many tracts had been cut or burned over before the State acquired them, or are presently traversed by main highways and interspersed with villages and private logging operations.

Thus, the concept of a vast, unspoiled wilderness area of several million acres is erroneous as applied to the New York Forest Preserve. Compared, for instance, with northern Maine or the National Parks of the West, our Adirondacks is a "tame" wilderness, indeed!

This is not to deny that there are both in the Adirondacks and Catskills extensive tracts of really wild country or scenic areas of surpassing beauty. But we must take our Forest Preserve for what it is, not for something it isn't, and never will be.

A lot that was true about the Adirondacks at 9 a.m. on November 25, 1950, had ceased to be a fact by 9 p.m. of the same day. During those twelve hours, an east wind of proportions never attained in this region in recorded history blew down about half a million acres of timber, of which roughly one half was on the Forest Preserve. With this wind, now known to foresters as "The Blowdown," went much of the best timber in the Adirondacks, including some of the remaining virgin stands of spruce and white pine.

This is not the place to relate the details of the "Blowdown" and the heroic measures, which are currently being undertaken by the Conservation Department and the wood-using industries of the North Country, to salvage the timber and reduce the fire hazard created by this calamity. That, as Kipling would say, "is another story." But it is worth bringing the effects of the November storm into this discussion to point up the difficulty of keeping the wilderness (or anything else, for that matter) in a perpetual state of equilibrium. Today, as in the past, natural processes are dynamic, not static, and once in so often the balances are going to be violently upset, no matter how we try to preserve them. We can make a law, but we can't fence out a hurricane.

Another point worth noting with respect to the "Blowdown" is the opinion given by the Attorney-General, on December 28, 1950, at the request of Commissioner Duryea who posed two leading questions: "May the fallen trees be removed from the Forest Preserve for the purpose of eliminating the fire hazard which they have created, notwithstanding the prohibition contained in Article XIV, Section 1, of the State Constitution?" "May the salvaged dead trees be sold or disposed of to private logging concerns?"

In a statement admirable for its clarity and comprehension of basic conservation principles, Mr. Goldstein answered, in part, as follows: "To observe the letter of the constitutional provision with the most extreme strictness by remaining passive in the present emergency, would ignore the spirit and purpose thereof and destroy rather than promote its efficacy. It is, therefore, my considered opinion that the first question should be answered in the affirmative.

"However, it is not intended hereby to sanction the wanton or promiscuous cutting of standing timber for the purpose of opening logging roads and for the installation of other required facilities. Necessity, not convenience, must be your guide in such matters.

"As to the sale or disposition of the dead trees that might be salvaged in eliminating the fire hazard, I find no statutory authority for your department to sell or otherwise dispose of such trees. Such authority will not be presumed (Pashley v. Bennett, 108 App. Div. 102). For such authority resort must be had to the Legislature.

"Since the salvage operation is so inseparably incidental, if not essential, to the elimination of the fire hazard, in my opinion it would be within the competence of the Legislature to grant such authority notwithstanding the prohibition contained in Article XIV, Section 1. Good conservation dictates that our natural resources be usefully employed and not wasted. To permit these dead trees to decay and rot away would accomplish no purpose contemplated by the framers of the constitution and would only add to the tremendous economic loss already sustained. In view of the grave emergency

(Continued on page 59)

Horticultural Commentary

Two Begonia Exhibits and Progress Between

By **T. H. Everett**

In 1939 The New York Botanical Garden exhibited at the International Flower Show in New York what undoubtedly was the most superb display of begonias that had ever been seen in Grand Central Palace. Many more than a hundred plants in more than a hundred varieties comprised the display, every plant a magnificent specimen and almost all in full bloom. Individuals between six and ten feet in height were plentiful, and all were clothed to their bases with healthy foliage. The exhibit was recognized by the award to it of a special prize and of two gold medals, including the Bulkley medal of the Garden Club of America.

That this display did much to stimulate further interest in a group of plants already popular horticulturally there can be no doubt—my immediate incoming mail showed that, and correspondence, conversations, and events since lend substance to this viewpoint.

Now, fourteen years later, The New York Botanical Garden is again installing an exhibit of begonias at New York's International Flower Show. This time the presentation will be different; instead of specimen plants arranged to form a decorative display against a background of rich purple-maroon draperies, a garden effect will be attempted. The garden will not be one that belongs in the eastern states but rather one that an enthusiastic collector and grower of begonias living in California might have. It will be contained in a lath house, a structure designed to provide welcome shade from too strong sunshine and to check, to some extent, wind and loss of atmospheric moisture. Inside the lath house, planted in beds with suitable paths between, will be the begonias that provide our Californian with his (or her) hobby.

There will probably be a few other shade-loving plants, for where is the true gardener who can confine himself to one group — even a group as interesting as begonias?

At this writing the final details of our exhibit are not worked out. We hope to include a fountain; a feature that would certainly be delightful and appropriate in a garden such as this, for begonias, while abhoring anything approaching a hundred per cent humidity, appreciate a reasonable dampening of air that tends to dryness.

Our lath house will be of modern design without curliques, gable ends, or other lines that would destroy the simplicity of plain rectangular surfaces. The begonias it contains will be a wide variety raised by our Head Gardener and his assistants, in anticipation of this show.

Some of the kinds included will be varieties unknown to gardeners of fourteen years ago, others will be old favorites long known and beloved by operators of greenhouses and growers of house plants.

Interest in begonias is widespread, and because fans are inveterate collectors, new species are frequently brought in from the wild and new varieties are obtained by hybridists and by the preservation of chance mutants. Let us look in part at what the past fourteen years have given us in the way of begonias — and where better to look than in the files of the official organ of the American Begonia

Begonia Mannii

Begonia maculata var. *Wightii*

Begonia socotrana

Begonia semperflorens "Gustav Lind"

Society? The Society, founded eight years earlier with a membership of seven, was at the time of our 1939 flower show exhibit a thriving organization of about seven hundred members and was publishing monthly "The Begonian." In the April 1939 number that grand lady cultivator and sponsor of begonias, Mrs. Bessie R. Buxton, reported as especially interesting a species included in the International Flower Show display of The New York Botanical Garden that had been brought back from Mexico the year previous by T. MacDougall. Unnamed at the time of the show, the newcomer was later determined by our E. J. Alexander to be *Begonia Liebmannii,* a species first described botanically in 1864 but believed not to have been previously in cultivation. In 1942 plants of this species were distributed by The New York Botanical Garden to its members, along with plants of that most gorgeously colored of rex begonias, "Glory of St. Albans," the original stock of which I brought to the United States from England in 1938. "Glory of St. Albans" originated as a chance seedling under the benches in the greenhouses of Sanders, the orchid growers, at St. Albans, England. It was given to me by my brother, who at that time was foreman in charge of Sanders' orchid houses.

In 1940 "The Begonian" reported the successful introduction through the efforts of Clayton Kelly of *B. Roxburghii.* This sturdy plant was one of several Indian species that came in about that time as the result of the organized efforts of officers of the American Begonia Society. One other, *rubro-venia,* stands out in my memory as being a distinct and worthwhile introduction.

In 1941 that indefatigable worker in the cause of begonias, Rudolph Ziesenhenne, presented in "The Begonian" the original description of the handsome trailing begonia "Elsie M. Frey," a hybrid produced by the lady after whom it is named by crossing *B. Baumani* with *B. glaucophylla.* The cross was made in 1939. It has brilliant deep rose-red flowers.

Helen K. Krauss, who later gave us BEGONIAS FOR AMERICAN HOMES AND

Begonia "Druryii"

GARDENS, in 1942 reviewed some of the new rex begonias. She called attention to those lately raised at Flaitz Gardens, Ojai, California, and gave deserved praise to B. "Ojai," B. "Verna," B. "Burgundy," B. "Ethiop," and B. "Panne Velvet." She discussed, too, a fine new plant by the same raiser that resulted from crossing *B. Evansiana* with a rex hybrid. This is B. "Francis."

A fine introduction of Constance Bower's, *B. rufida,* made its bow in the pages of "The Begonian" in 1943. This is a variety distinguished both by fine foliage and by an abundance of good-looking white flowers freely decorated with red hairs.

Five new "miniature rexes," resulting from crossing a rex hybrid with *B. McBethii,* are described in 1943 with the promise of their early offering to growers. The brilliant newcomers, which included "Linda Lewis," "Donald Lewis," and "Rosy Morn," were raised at the Lewis Begonia Gardens. Other miniature rexes resulted from Roy Berry's crossing of *B. Dregei* and weltoniensis with rex hybrids. These crosses gave us "Annie Robinson," "Toy," and others, discussed by Helen Krauss in 1943.

Begonia Liebmannii

In June 1944, in a two-page article entitled "New Begonias in The New York Botanical Garden," Bessie R. Buxton called attention to and described more than a dozen kinds including "Perle de Gard," "Gloire de Jouy," and *B. Mannii,* the last-named a curious species that hails from Fernando Po and that needs plenty of warmth for its well-being. The plant observed by Mrs. Buxton was introduced by The New York Botanical Garden from Germany in 1939 and is closely related to another West African species, *B. Poggei* which I brought from the Royal Botanic Gardens, Kew, in 1938.

W. D. Holley, who in 1941 began directing at the University of New Hampshire a class project in the hybridizing of wax begonias, described in 1945 the work done and the results accomplished. He began with the Swedish-raised "Gustav Lind" or "Westport Beauty" as it was misnamed (the first double-flowered wax begonia, I believe), "Geneva Scarlet," "Geneva Rose," and single-flowered types and raised a lot of grand new doubles, many with fine dark red foliage which was obtained by using the dark-leaved *B. semperflorens* "Carmen" as a parent.

Of great importance, too, was Holley's work with *B. semperflorens* "Calla Lily," the despair of all cultivators except those fortunately located in a New England farmhouse or its

equivalent. By crossing the calla begonia with green-leaved wax begonias, Holley produced a whole series of intermediates and extremes, many of which are much easier to grow than the original "Calla Lily."

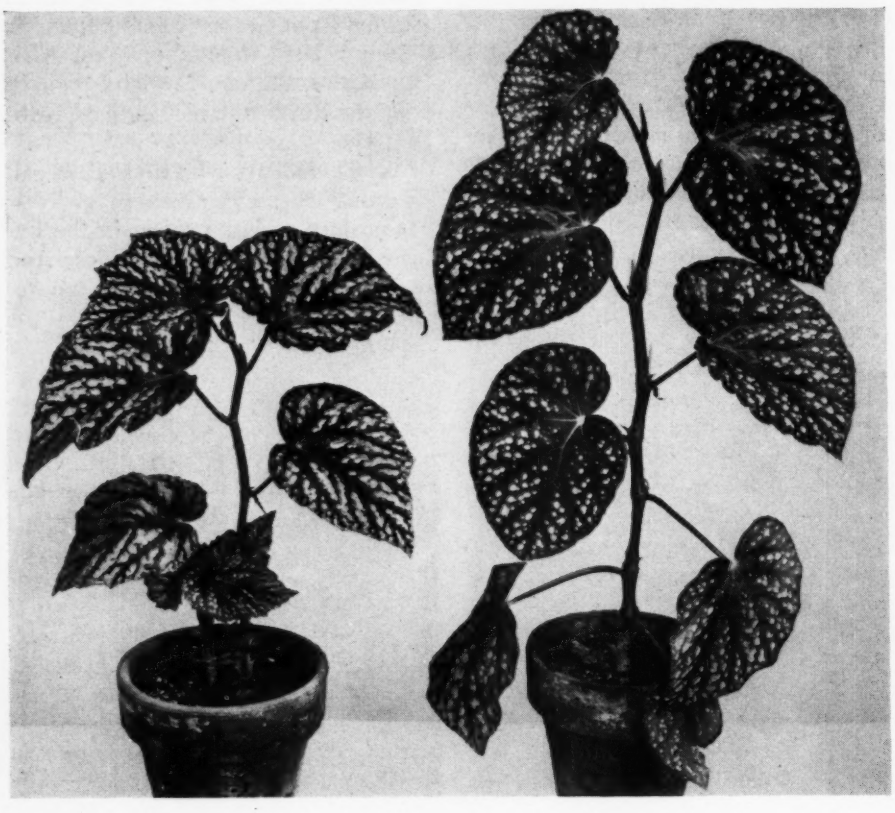
The year 1947 finds several Ziesenhenne introductions offered in "The Begonian," including the rhizomatous kinds "Skeezar," "Freddie," "Jimmie Decker," "Thilda Fischer," *Dayi,* and *Griffithi,* the latter an Indian native and one of the ancestors of modern rex-cultorum varieties. In this same year a number of Leslie Woodruff's fine rex-cultorum hybrids are illustrated in color. Notable are "Twisty Spot," "Curly Stardust," "Double Black Twist," "Giant Twist," "Silver Sweet," "Calico," and "It." "Orange Rubra," a Woodruff dichroa hybrid with blooms as lovely in color as its orange-flowered parent, also appears and so does the first hybrid between rex-cultorum and a tuberous begonia, Woodruff's "Fantasy," a variety with characteristic rex foliage and double pink flowers three inches in diameter.

The pages of "The Begonian" continue to record the introduction of new kinds. In succeeding years, we find reference to such good varieties and species as "Lulu Bower," "Joe Hayden," "Ricky Minter," *Kenworthyi, Schulziana,* and *circumlobata.*

In 1950 descriptions of the charming semperflorens varieties "Ballet" and "Pied Piper," originated by the late Ernest Logee, are described.

Skipping now to the most recent issue of "The Begonian," we find pictured three begonias raised in Belgium just before the last war. "L. R. Russel," "Axel Lange," and "Frau Hoffmann." I am happy to report that as a result of a recent expedition to Europe, I succeeded in bringing back the two first named and that these will probably be on display in our 1953 exhibit. They have the beautiful foliage of fine rex-cultorums, but they grow tall and retain their foliage in good condition all winter.

The photographs accompanying this "Commentary" illustrate, in addition to kinds already mentioned, *socotrana,* a species that has proved of tremendous importance to the hybridist and which comes from the island of Socotra in the Indian ocean; Druryi, a handsome California - raised variety that I have never known to bloom, but which is well worth growing for its foliage alone; and *maculata Wightii,* a fine spotted-leaved "cane" variety that I brought from England in 1934.



L. R. Russell (left), Axel Lange (right), two new English varieties

Adventures with BEGONIAS

By Elsa Fort

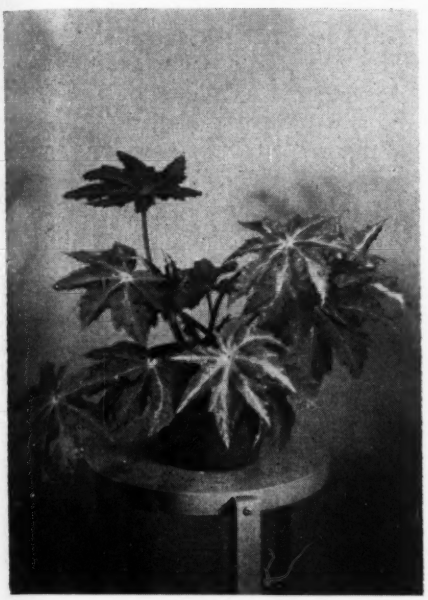
THE discovery of the first begonia in 1690 in the West Indies must have been a thrill to the Franciscan Monk, Charles Plumier, who was accompanying Michel Begon, then the Marine Administrator of France and the Governor of Santo Domingo. The two men, both devotees of science, discovered six species of plants, new to them, which bore no relationship to any other species then known. They were taken to France and carefully studied and recorded by Joseph Pitton Tournefort, who named the new genus in honor of his friend Michel Begon and described it by publication of the facts as established by reports of discovery by Plumier in the records of the *Institutiones Rei Herbariae.* The six plants carried to France were very frail specimens, but they were carefully nurtured and their habits closely watched, and today two of the original specimens, *B. rotundifolia* and *B. macrophylla,* are in American culture.

Through all the intervening years, begonias have been among the most-loved house plants, being very adaptable and responsive in their habits and having the ability to acclimate themselves to almost every condition of home growing and neglect. Of course, they do not bloom under too adverse conditions. However, the foliage of the begonia is so outstandingly distinctive that a well-grown plant requires no bloom to make it a plant of beauty. In fact, many begonias lose their beauty of foliage after they have bloomed, and it is well, for example, to remove the flower buds from the rex before they have opened.

In southern California, especially, where the climate is ideal the year round for the growing of begonias outdoors, a vast program of propagation and hybridization has been making strides since its inception over fifty

years ago. Several of the hybridizers are working on miniatures suitable for the narrow window sills of modern homes. To accomplish this a species is used for one parent, and if no suitable species is available for the other parent, then a hybrid; they are cross-pollinated and many times it is the fourth or even more generation which is put on the market for the eastern begonia growers.

Let us take a look at some of the old favorites. As above stated, *B. rotundifolia* was one of the original species



Begonia "Reichenheimi"

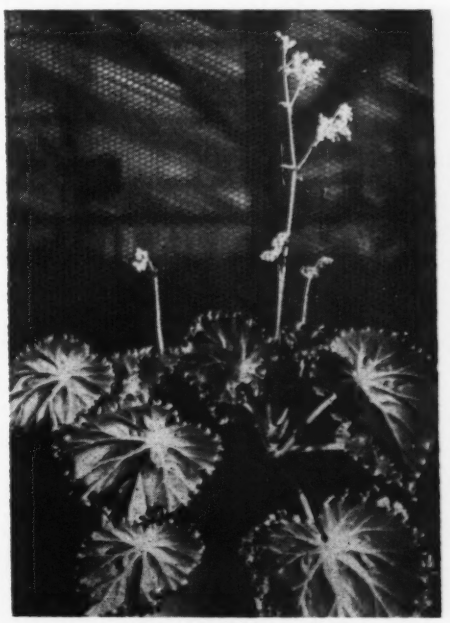
discovered. It is of the rhizomatous root type; that is, the root is above the ground with the rootlets seeking the earth out of the joints of the leaves. This is a very low-growing plant, with the leaves glossy yellowish green, the flowers very few and pink in color. *B. rotundifolia* grows in Haiti, at an altitude of about three thousand feet, and makes a good plant for a window sill where cool air filters through the cracks around the sash. It is a very lovely small plant and a person who is interested in hybridizing and able to get pollen, will find that it is a wonderful parent for miniature begonias.

B. macrophylla is the fibrous-rooted type; that is, all the roots grow beneath the earth in a root mass and the stem is above the ground. This begonia grows to a height of from three to six feet, depending upon its environment. The leaves are large, smooth in texture, very glossy green, ovate pointed, with the margins toothed. The flowers are green-white and in loose clusters, blooming around the center blossom in cymose formation.

While begonias are found mostly in tropical countries, they are adaptable to the climate of North America. Of course, many begonias of today are hybrids and have been tested in this climate. One species, however, *nitida*, discovered in 1777 in Jamaica and the first living begonia introduced to England by Dr. William Brown, is still one of the best-loved begonias. *B. nitida* is a beautiful plant to possess, very easy to grow and requiring little care. The plant develops very gracefully to a height of about three feet, but by tip pinching and shaping can be made into a lovely bushy specimen. The stems are red, the leaves a very glossy dark green, and the flowers a very light shell-pink, very wide open, spilling out and over in graceful open sprays at the ends of the branches. The flowers last weeks before falling from the cluster, and the seed pods are very beautiful when the flowers have gone. *B. nitida* blooms best in winter, although it has been known to bloom all summer for some proud possessors. The two sexes are very prominent among the flowers, and either one makes a good parent. The plant is fibrous-rooted and is very easy to propagate.

For years, "Aunt Millie" has had begonias on her kitchen window sill, shedding all sorts of dried leaves, sloughed off stems, and papery dead blooms — the semperflorens or wax begonias. These are the "common" ones so often seen in florists' shops, a mass of bloom and the leaves very glossy and either dark green or red, or, in the case of the little double rose type, a light soft green. The "semp," as it is called for short, has been used as a parent for the new hybrid, very double, dark-leaved begonias. These are extra fine and are not as hardy nor as easy to grow as the common "semps." The new Thimbleberry hybrids, which were the first large double ones with dark red leaves put on the market, are rarely propagated except by root shoots or axil shoots, for they rarely set seed and seldom come true to type when seeds are obtained. Both the rose doubles and the new dark-leaved doubles are not easy to keep happy. One can come down in the morning to find his choicest plant has, figuratively, fallen to pieces, after having left it in good condition the night before.

One of the oldest begonias favored "Angel Wing," properly named "Lucerna" and "President Carnot." They are horticultural forms of the species *coccinea*. Both are very tall-growing and bear pendants of dripping red to pink blooms, with the three-sided ovary very pronounced and usually showing a white line in the divisions. The leaves are very large, dark green, and red underneath, being heavily spotted with white; due to the upper lobe being upright, almost in line with the lower pointed lobe, these plants have been called "Angel Wing." Recently a new hybrid was introduced from "Lucerna," the "Purple-Spot Lucerna." The leaves are identical in shape to those of "Lucerna," but have purple spots instead of white. The flower is somewhat smaller and it is



Begonia "Rickey Minter"

not as profuse a bloomer as its parent "Lucerna."

In 1946 a begonia was discovered by Thomas MacDougall on the ranch of Don Lisandro Maza in Mexico near the Guatemalan border and brought back to California. This begonia grows in forest areas of about two thousand feet altitude; and while it can be grown in the ordinary house, it is best grown in a terrarium or Wardian case, as it is a moisture-loving plant. *B. Mazae*, as it was named in honor of

Don Maza, is a fibrous-rooted begonia, with leaves a very satiny chocolate-brown on top faced with a rich red on the reverse. The texture of the whole leaf is very much like shimmering satin. It makes a good hanging basket plant, for it droops naturally over the sides of the basket, with the ends turned upward. The leaves are heart-shaped with a pronounced point, and the veins ending in the light green sinus are darker than the reverse. Some plants bear much darker leaves than others. The dark leaf *Mazae* is the true *Mazae;* the others are variations. All are colorful and their habits identical. The bracts are very beautiful, turning back with a lovely curl after the leaf has unfolded from the stem. The flowers are light pink and are borne on long slender stems well over the foliage; the two sexes are very strong in each flower cluster.

Temperamental as *Mazae* is, it has been used very extensively as the parent in many new hybrids which are being sent from California. One of the most outstanding is "Joe Hayden." When one sees Joe Hayden, it is hard to credit *Mazae* as a parent, for "Joe Hayden" has large star-shaped leaves, rhizomatous root, and many of its characteristics can be traced to its other parent, begonia "Reichenheimi." A number of the miniature begonias have *Mazae* as one of their parents — "Spaulding," "Tamo," "Gypsy Marie," "Helen Krauss," "Snickey," "Marie Reed," and other seedlings which have not been named nor registered but are being tested for suitability in the average home.

Perhaps the most outstanding new begonia is "Ricky Minter," a Marie Turner hybrid which is a cross between *B. cristata* and *Mazae*. This is a rhizomatous begonia, rather large growing, very neat and not straggly, and startling with its ruffled margins. The ruffles, a characteristic from *cristata,* are outstanding and unusual. The leaves are very dark green and brilliantly faced with red, and very deep veined as is *Mazae*. The rhizomes do not curl around the pot, as in the Erythrophyllas, but hug the top; and the leaves grow rather close together on the rhizome, thus making a full plant at the pot line. The flowers are borne on long stems and form a loose cluster, just as the old-fashioned "star begonias" do. It is the most outstanding plant one can have in a collection of good begonias. When one sees "Ricky Minter" and "Joe Hayden," it is very hard, indeed, to believe they both have the same parent *Mazae;* yet upon very close examination, one can trace the most beautiful characteristics of *Mazae* in both plants.

A little study of the environments from which the original species came, together with a knowledge of the parents used in crossing for new varieties, is very useful and extremely interesting. Even picking out the little seedlings found in the pots after the plant has bloomed and dropped its fine dust-like seeds, potting them and watching them grow, and tracing the characteristics of the surrounding plants in the little seedlings is an adventure. Many new varieties have been discovered just that way and have paid royal dividends to the discoverer when marketed, after having been registered with the American Begonia Society and its name approved. It is well not to throw out the soil in which a begonia has been grown over the winter, for many of the winter-blooming begonias drop seeds on the earth — and many times it takes a year for germination, depending upon the parents of the seeds. However, more exciting fun can be had from really crossing one plant with another and awaiting results.

Old or new, small or large, species or hybrids, rex or "semp," tall or creeping, pot or basket, foliage or blossom, easy or difficult — the field of begonias is a wide, open, adventurous one to the real plant lover, and one which never will be closed to the person journeying therein. And a heart-warming sight is a window filled with begonias, different in shape and texture and color of foliage and flower, with the sun shining on them or night lights making entrancing shadows.

SANTA ANA BOTANIC GARDEN **(from page 37)**

University on a National Research Council Fellowship, studying the Thaxter collections in this group. At Claremont he is continuing these studies and is doing general work on fungi, especially of southern California.

Dr. Philip A. Munz is engaged with Dr. David D. Keck of The New York Botanical Garden in preparing a Manual of the California Flora. The last complete work of this sort, by the late W. L. Jepson, was published in 1925. Botanical exploration of the state during the past quarter of a century and recent monographic work make a new flora most desirable. For purpose of discussion of the ecological niche occupied by a species or its subdivisions, Munz and Keck have classified the vegetation of California under twenty-eight Plant Communities, with such divisions as Redwood Forest, Mixed Evergreen Forest, Yellow Pine Forest, Northern Oak Woodland, Joshua Tree Woodland, Chaparral, Creosote Bush Scrub, Valley Grassland, and Pinyon-Juniper Woodland. Allocation to the proper Community or Communities with data on altitudinal and geographic range as well as habitat, offers more exact information for the species than has customarily been given. Where available, chromosome counts are also included.

Percy C. Everett, the Garden superintendent, is putting together the data that have been accumulated during the past twenty-five years on propagation at the Garden and on the handling of the more difficult species. In general, in an arid region it is very difficult to break seed dormancy for many plants. Some seeds contain inhibitors that prevent germination unless thoroughly leached. In some cases, treatment by strong acid or great heat (such as can be obtained by use of boiling water or by burning straw over the seed flat) will start growth.

Beginning in April, 1953, the Garden will again be open to visitors. By that time there will be a good display of annual and other herbaceous plants. Really representative specimens of California trees and shrubs will not, of course, be sufficiently developed by then to give any adequate idea of their species, although many of the shrubs will begin to flower in 1953. Members of the Garden staff will be available for consultation as to horticultural value of various plants, whether and where they may be obtained, and what their chance of success may be under different conditions. However, it will be some years before the connotation that goes with the name "botanical garden" will really be applicable at Claremont.

All About Soil Conditioners

By P. P. Pirone

FIFTEEN MONTHS have passed since the Monsanto Chemical Company first announced the development of a synthetic chemical, named Krilium, to improve the physical structure of certain soils. Within a few months of the original announcement, new brands of soil conditioners began to appear like mushrooms after a warm spring rain!

It seemed that anyone with but a nodding acquaintance with organic chemistry felt capable of concocting a new soil conditioner. Some of the advertisements carried in the Garden Sections of the Sunday newspapers and in some garden magazines stated or at least implied that, at long last, every soil and lawn problem could be solved merely by sprinkling some of the diluted chemical over the surface. Some of these quickly developed soil conditioners, widely advertised last spring and summer, have been found to be virtually worthless by reliable soil experts.

Some manufacturers failed to realize that even though a chemical has physical and chemical characteristics similar to tested soil conditioners, it may be completely inactive as a soil stabilizer.

It is indeed unfortunate that the synthetic soil conditioners have been so commercialized — some being marketed without adequate testing — that there is grave danger of public reaction against the whole field of agricultural chemicals. It is this sort of situation which brings joy to a certain segment of our garden population, which blames all of man's present ills on the use of chemicals in agriculture!

Despite all such adverse reactions and disappointments, however, I feel that synthetic soil conditioners are here to stay. My opinion is based on a study of research already conducted by bonafide soil experts in cooperation with the Monsanto Chemical Company and my own personal experience in using about five hundred pounds of Krilium during 1952.

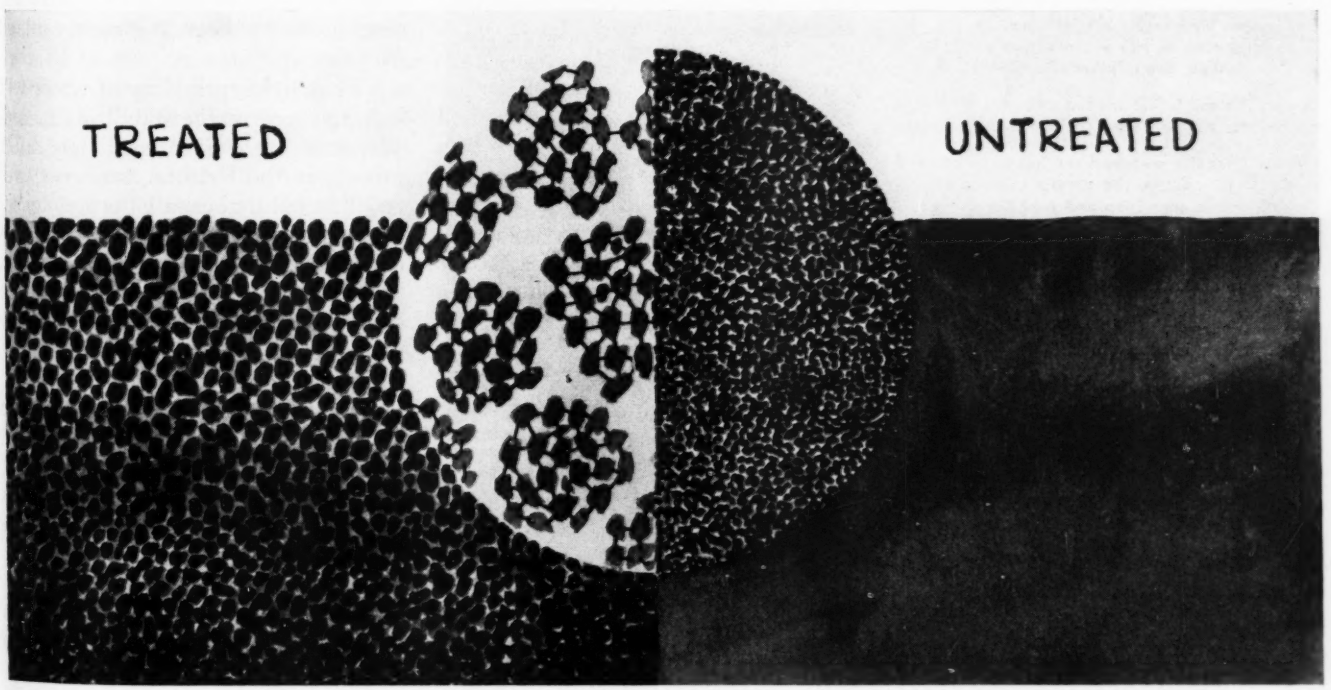
There is no doubt that synthetic soil conditioners, *rightly made and properly applied,* do remarkable things to a clay soil. They can transform tight, gummy clays into friable soils of crumb-like structure. Such soils are more spongy and porous even when wet. They allow air to penetrate more readily and water to percolate more quickly, thus providing conditions which favor better root development.

Before describing how the new soil conditioners work and what they are made of, I believe it is advisable to review some basic facts about soils.

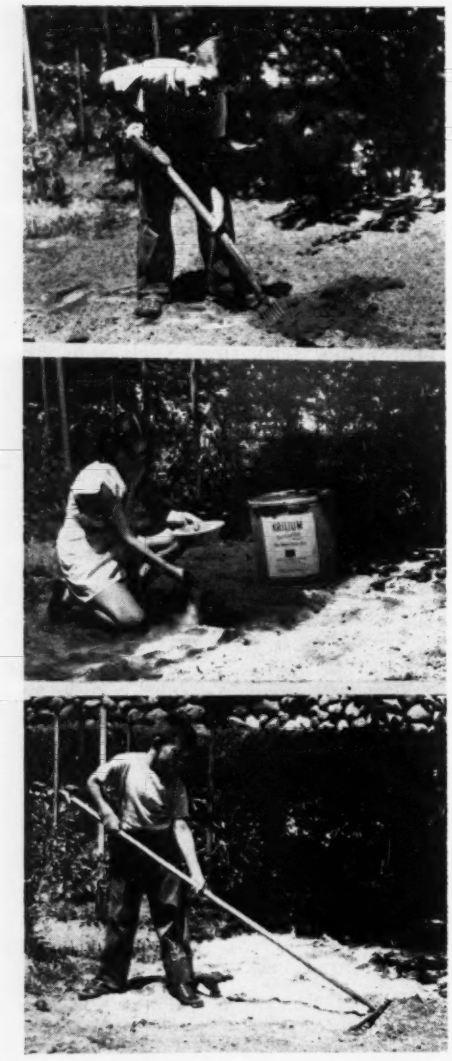
SOIL PROPERTIES

The physical properties of soil are dependent on texture and structure. Soil texture is governed by the relative amounts of sand, silt, and clay in the mixture. Soil structure is governed by the arrangement of these particles into relatively stable chunks or aggregates.

A soil with good physical structure contains a mixture of aggregates ranging from pinhead to pea in size. A soil with poor structure, that is, one made up largely of clay particles which are



Schematic representation of soil conditioners in stabilizing aggregates in clay soils



The proper way to use synthetic soil conditioners is demonstrated by two of the author's children in their grandfather's garden

Upper. **The soil is first spaded and stirred to form aggregates ranging from pinhead to pea in size**

Center. **After the prepared soil has been allowed to dry a bit on top, the correct amount of synthetic conditioner is spread over the surface**

Lower. **Immediately after spreading the conditioner, the soil is stirred to the proper depth, depending on the amount of conditioner added and the crop to be grown. Within a few hours, the conditioner reacts to bond the soil aggregates into a stable form.**

not bonded into aggregates and tend to disperse independently, is difficult to handle. It packs during rains and bakes hard when dry. Seeds planted in such a soil will rot more readily and seedlings often fail to emerge, because they cannot push through the tough surface crust which forms after a rain.

Every gardener knows that a heavy soil is improved by incorporating manures, peat moss, or other kinds of organic matter into it. Not so well known, however, is the reason why these materials improve the soil.

The improvement is due largely to the aggregating power of natural resins, known as polyuronides and related carbohydrates, which are formed from the decomposing organic materials. These natural resins have the power of bonding together a group of clay particles to make larger particles.

The synthetic soil conditioners also have the power to bond clay particles in heavy soils. This is accomplished by a process known as ion exchange — a process a bit too technical to delve into very deeply in this article. The multiple charges of the synthetic soil conditioner molecule couple with the charged particles in the soil to fix the soil into stable aggregates of just the right size for good soil structure. The binding or fixing agent in most of the effective soil conditioners is based either on the chemical polyacrylonitrile or on the copolymer derived from vinyl acetate and maleic acid.

A schematic representation of what actually occurs when a synthetic soil conditioner is properly applied, is presented in the illustration of treated and untreated soils.

Synthetic soil conditioners have one important advantage over the natural conditioners derived from organic matter. The clumps or aggregates formed by them are far more stable, since they are not readily subject to decomposition by soil microorganisms. Organic matter has to be replenished in a soil because the natural soil conditioners, the polyuronides, are broken down by the soil microflora. This is not the case with the synthetic materials. Some clay soils treated with Krilium nearly four years ago, for example, still retain good porous structure. How much longer they will retain it, only time will tell.

Present Work

Because the Monsanto Chemical Company was the first to test thoroughly synthetic soil conditioners as such, I decided to use its product in our tests. Most of the tests were conducted as a cooperative venture with the New York City Department of Parks.

Many of the following points, therefore, were gained in the course of our tests with Krilium powder in 1952 and from several technical articles published by Monsanto's research staff and agricultural experiment station soil specialists.

(1) Before the structure of a clayey soil can be improved, the Krilium must be brought into intimate contact with the soil particles. This can be done only by turning the soil over before applying the Krilium powder. The soil must be stirred beforehand so that the aggregates are formed, ready to be fixed into stable form when the conditioner reacts. *Soil conditioners will only maintain or protect a physical condition which has already been created.*

(2) The soil should be allowed to dry a bit on top before spreading the Krilium. If the soil surface is too moist, the Krilium takes on moisture, becomes gummy, and cannot be well mixed.

(3) As soon as the Krilium is applied, the soil should be stirred to the proper depth either with a spading fork or a rake. Two of the author's children demonstrate, in the accompanying illustrations, how to apply Krilium to a small area.

In our larger plots we used a power-driven Rotovator, which did an excellent job of thoroughly mixing the Krilium into the top six inches of soil.

(4) Synthetic soil conditioners work quickly. Aggregates can usually be stabilized in less than a day after the conditioner has been thoroughly mixed into the soil.

(5) A light sprinkling of water will help to speed up the stabilizing action. Flooding the soil immediately after mixing in the Krilium, however, will result in failure because the soil aggregates will be broken down before the chemical has a chance to do its work. Several reports of failure with the material were found to be caused by flooding the soil before stable aggregation occurred.

(6) If too much soil conditioner is used, it may make the soil hard enough to drive a tank over it! Hence, for perfect results the material must be used in the exact amounts, over the exact area and to the proper depth. Reliable soil conditioners contain the exact directions for use with each package. They should be followed to the letter.

(7) Although Krilium will be of

some benefit in silty soils, it works best on clay soils. In one series of tests on a silty soil, which had been barren of even weeds for the previous five years, we were able to grow an excellent crop of perennial rye grass in 1952 by incorporating lime, plant food, and Krilium.

In another cooperative test with the New York City Park Department, we applied the Loamaker formula of Krilium to golf putting greens to depths ranging up to two feet. The weatherman did not cooperate with us in these tests. We had some difficulty in getting the grass established in the treated areas. The growing season ended before we were able to draw any definite conclusions on these golf greens. We are hoping that we may yet obtain some result, one way or another, in these plots this spring.

I (through my oldest son Thomas) did secure excellent results in our lawn. For the past five years, I had been trying to raise a good lawn in a soil which is largely clay derived from subsoil. Despite occasional applications of peat moss, it still packed hard during dry spells. Moreover, as soon as summer arrived, crabgrass took over, especially in the more poorly drained areas.

Last fall my son Thomas decided to remake the lawn and try Krilium. He turned over a test area of about one hundred fifty square feet, removing all the crabgrass, weeds, and what remained of the desirable grasses. He properly incorporated the right amount of the Merloam formulation of Krilium, lime, and plant food into this area and seeded it. An adjacent smaller area, about forty square feet, was handled in the same way but without the Krilium.

At this writing in mid-December, even my doubting Thomas has to admit that the area treated with Krilium is far better than the control area. We've never had such a lush lawn!

My youngest son Joseph and my daughter Mary treated an area of approximately one hundred square feet in Grandpa Pirone's vegetable garden early last summer. Grandpa then planted one of his favorite salad greens, leaf-mustard *(Brassica juncea)* in this area as well as a small untreated area nearby. He quite naturally sowed the seed rather thickly, as is his custom. He was surprised to find that practically every seed produced a plant in the treated area. This was largely due to the more porous condition of the soil and to the lack of crusting of the soil surface. The treated area continued to produce a prolific crop all through the summer and fall. Even now, in mid-December, Grandpa Pirone continues to harvest his leaf-mustard for salad.

Liquid Soil Conditioners

My experience with liquid soil conditioners was limited to one product not yet being marketed. After using it and absorbing all the reliable literature on other liquid soil conditioners, I have concluded:

1. Liquid soil conditioners will not work, if they are merely poured over unstirred soil or over lawns.

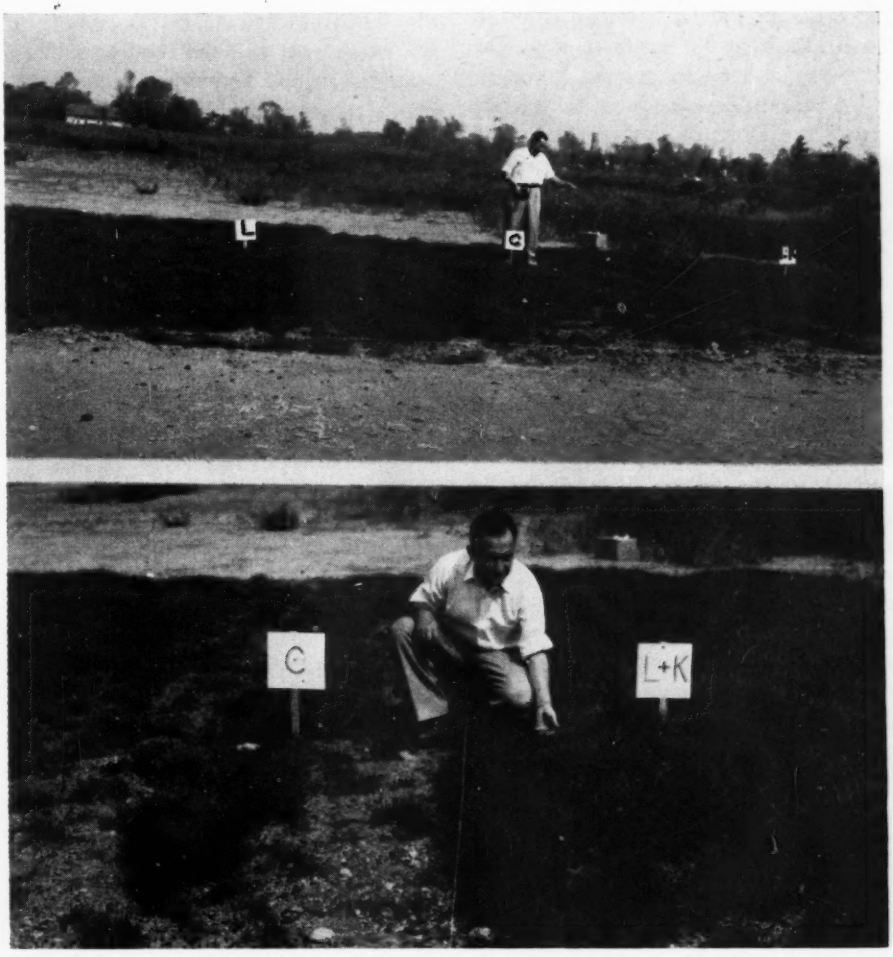
2. They will not penetrate to any great depth. Even if they did penetrate, however, they would not cause aggregation unless the soil was stirred and in aggregate form beforehand.

3. Some liquid soil conditioners lose their "activity" when dissolved in water. Still others are recommended in such great dilutions that it is questionable whether they do any good.

Costs

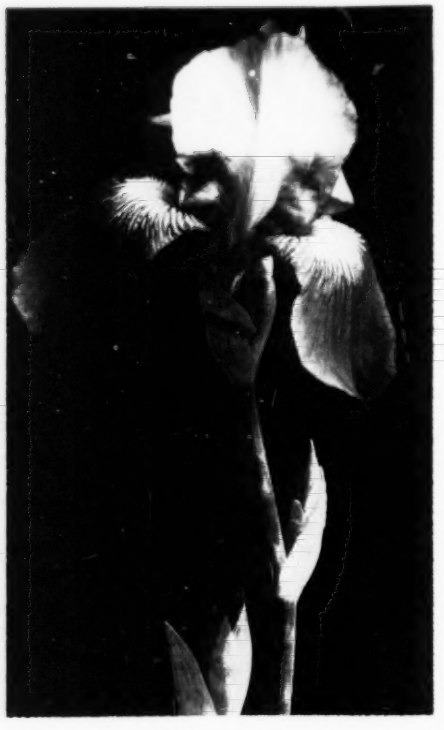
Synthetic soil conditioners are still rather expensive. The powders cost from $1.30 to $5.00 a pound and the liquid types around $10 a gallon. The cost of treating one hundred square feet of soil varies anywhere from $.66 to $7.90, depending on the manufacturer's directions and the material used. The expense is justified on heavy soils used for lawns, athletic fields, greenhouses, and house plants. Soil conditioners are finding use in special farm problems where the value of the crop justifies the relatively high expense of incorporating them deeply. In other cases, the amount required can

(Continued on page 55)



Upper. The author is shown testing plots in a silty soil where no plants could be grown in the previous five years

Lower. Close-up of an excellent crop of perennial rye grass where lime and Krilium had been incorporated into the silty soil. Note the inferior stand of grass in the control plot.



"Morning Splendor," originated by J. Marion Shull, is reported to be a cross between "Amas," used in many early crosses, and *I. trojana*

Iris

Its History to 1935

By John C. Wister

THE IRIS is one of the oldest inhabitants in gardens. Dioscorides in the Sixth Century wrote of it as the source of a drug to remove freckles, and a thousand years later the physician of the Duke of Somerset wrote a book in which he recommended a broth made of iris "sodden wyth wyne" as a mouth wash.

In 1576 Clusius published a list of nine species of iris from southern Europe, and in 1601 he described twenty-eight tall bearded iris with the remark, "a long experience has taught me that irises grown from seed vary in a wonderful way."

In Queen Elizabeth's time, John Gerarde wrote, "There be many kinds of Iris or Flouer-de-Luce whereof some are tall and great and some little, small and low, some smell exceeding sweet in the roots, some have not anie smell at all; some flowers are without any smell and some with; some have one color, some have many colors mixed; vertues attributed to some, others not remembered." These included a plant that Linnaeus later called *Iris germanica*. Later it was learned that its home was not Germany but Asia Minor, and that it was not a true species. There was also an Italian plant, Florentina, famed as a source of orris root, and finally there were the forerunners of today's tall bearded iris. All of these our grandmothers and great grandmothers grew and called "Flags."

In the Nineteenth Century, when botanists made classifications of *Iris*, they enumerated a number of bearded iris species from Europe, including *Iris pallida* of Italy and *Iris variegata* of Hungary, both now accepted as authentic botanical species. Some botanists included as species *Iris amoena, plicata, neglecta,* and *squalens*. There was doubt about their botanical standing and W. R. Dykes, an English schoolmaster (and later Secretary of the Royal Horticultural Society) in the early years of this century, suggested that tests be made to determine their actual status. This was done first, by growing selfed seedlings of each of the so-called species, and second, by making crosses between species *pallida* and *variegata*. Experiments with the first system resulted in a conglomeration of varieties of every color. Later, the second method produced exactly the same things, proving to the satisfaction of present-day botanists and horticulturists that the four so-called species were not species at all, but merely accidental hybrids.

Jacques, the royal gardener at Neuilly in Paris, is the first important iris grower definitely known to us. Between 1815 and 1830 he put on the market the fine golden-yellow variety "Aurea," which for a full century held an important place in gardens. It is doubtful if today's varieties will retain their importance for a quarter of that time. This does not mean that we are drifting backward, but, on the contrary, that we are progressing so fast that the finest varieties are quickly superseded.

The first important raiser of iris, the nurseryman Lemon of Belleville,

"Alcazar," one of the early crosses by Philippe de Vilmorin, brought medals to his firm and started its extensive iris breeding program

admired Jacques enough to name one of his first and finest seedlings "Jacquesiana" in his honor, in 1840. We still have it in our historical collection at Swarthmore. Its popularity is perhaps best shown by the number of times it was renamed and sent out as a novelty under the names "Cardinal Richelieu" and "Caroline de Sansal" in France and "Lord Rosenberry" in England.

Lemon introduced a hundred or more varieties in the 1840's, among them one also popular for nearly a century, named "Mme. Chereau" for the wife of the then President of the Société Nationale d'Horticulture de France.

Lemon's seedlings showed the regular pattern later produced experimentally by Dykes and Bliss. They ranged from pure white through pale blues to deep blue-purple, through pale pinks to deep red-purple, through a series of blends containing blue, pink, and yellow, and finally through the yellow selfs and bicolors. From his time until about 1915, the bulk of the hundreds of new irises that were introduced came from the same general parentage and followed the same general pattern. They were good plants, tough, free-blooming. While the flowers were

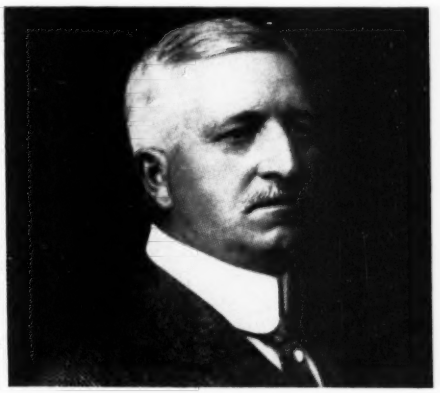
rather small and crowded at the top, they made fine pictures in gardens and grew without much trouble. Some persist in gardens to this day, their names unknown to their owners. Among them are "Celeste" in pale blue and the brown and yellow "Honorabile."

Some were raised by Lemon, some by other French breeders in the 1850's and 1860's, and by the British in the 1870's and 1880's. Many with English names were merely varieties purchased on the Continent and renamed. The first American Iris Society Test Garden, established at The New York Botanical Garden in 1920, eliminated some hundreds of names as synonyms during its first three years.

In the 1890's and early 1900's, real progress was made in France by Eugene Verdier, who introduced "La Neige," "Mercedes," "Nuee d'Orage," and "Parc de Neuilly"; and by Vilmorin, who introduced "Caprice" and a number of others as a sort of introduction to the famous varieties that came ten or more years later; by Cayeux, who introduced "Ma Mie" more than twenty years before his sensational varieties like "Pluie d'Or" and "Depute Nomblot." In Germany Goos and Koenemann introduced "Fro," "Gajus," "Iris King," "Princess Victoria Louise," and "Rhein Nixe." In England Barr introduced "Albert Victor," "Perfection," and "Princess Beatrice"; Reuthe introduced "Maori King" and "Mrs. Neubronner"; Foster introduced "Mrs. G. Darwin" and "Mrs. H. Darwin"; and Perry introduced "Black Prince," leading us directly to the real begining of fine iris growing in this country. For it was from Barr that Bertrand H. Farr of Wyomissing, Pa., purchased his first great collection totaling several hundred varieties divided into six so-called botanical sections.

Astounded at the color range of these irises, Farr grew seedlings just as Lemon had done, and came up with some beauties which he named "Wyomissing," "Glory of Reading," "Mt. Penn," and "Juniata," for nearby places, "Windham" for the village in Vermont where he was born, "Anna Farr" for his wife, and "Pocahontas" and "Quaker Lady," the last perhaps the loveliest of all and certainly one of my all-time favorites. He showed them at the 1915 San Francisco Fair and won a gold medal. American iris history had begun.

All these were hybrids of *Iris pallida* and *Iris variegata* and followed the same pattern as the older varieties of Lemon. Very few gardeners knew that an iris revolution had been brewing for over thirty years and was ready to burst forth just as the Kaiser plunged the world into war.



American iris history began with Bertram H. Farr. In 1896, Farr erected the first residence in Wyomissing, Pennsylvania; collected all the varieties then in existence, and began to raise seedlings. Visitors came from all over the country to view his fine collection, and gradually Farr's hobby became his business.

This revolution was started in the 1880's by Professor of Physiology (later Sir) Michael Foster, a Cambridge physician. A keen gardener, he had arranged with missionaries and other travelers to send him plants from distant places. Among them there came from Asia Minor a group of iris which had not before been grown in gardens. They were plants with very tall and not too strong stems, wide branching and large flowers, often of rather floppy form. They formed a great contrast to the more dwarf, smaller-flowered, and crowded branching of the varieties of the past.

Sir Michael identified them by such names as "Cypriana," "Kashmiriana," and "Trojana" and began to cross them with the older garden varieties. He produced large-flowering plants which were a revelation to garden visitors. They did not get into commerce until after his death, when the nurseryman, Robert W. Wallace, named one of them "Lady Foster," another "Crusader," and a third "Kashmir White." These, with one Sir Michael had jokingly called "Caterina," were offered in the Wallace catalogue of 1912 and 1913 and reached this country in 1916. They were a sensation, but, alas, in our eastern states they were not good growers. They were shy blooming, often subject to rot, and hardly any have survived. A school teacher friend of Sir Michael, Sir Arthur Hort, made similar hybrids.

Sir Michael bequeathed voluminous notes to Dykes, which formed the ground-work for the latter's monograph on iris botany.

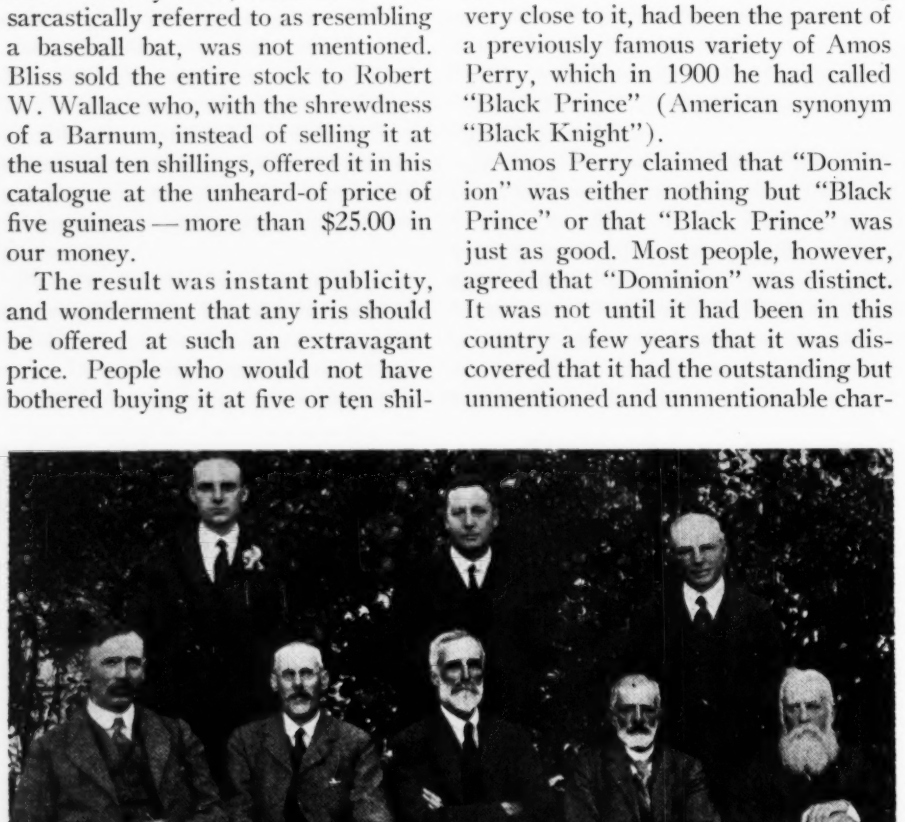
In the late 1890's, W. J. Caparne, an artist in Guernsey, became interested in the dwarf early-blooming species, *Iris pumila* and *Iris Chamaeiris*, from the mountains of Europe and Asia Minor. Besides growing improved seedlings of these, he crossed them with tall bearded varieties and produced a race intermediate in size and time of bloom. Goos & Koenemann in Germany made similar hybrids.

Sir Michael had in his garden a plant which he called "Amas," for the district in Asia Minor from which he had received it. From it his friend George Yeld, a Yorkshire schoolmaster, produced some fine seedlings, and one of these, Lord of June, reached this country about 1916. It was a sensation, and a much better grower than the Foster varieties. Apparently, this same "Amas," under the name "Macrantha," had been sent from Asia Minor to France. There the firm of Vilmorin began to use it, crossing it with seedlings which had been bought from Eugene Verdier. From one of these early crosses by Philippe de Vilmorin came the famous variety "Alcazar," which brought compliments and medals to the firm and started it on the road to iris breeding — a road that led in 1920 to the famous "Ambassadeur," "Ballerine," and Magnifica," and to the many plants which the firm named after the Paris theatres — "Opera," "Eldorado," "Ambigu," "Cluny," "Medrano," and others.

About 1910 A. J. Bliss, a retired British civil engineer, struck up a correspondence with Dykes, and as a result conducted experiments into the heredity of some of the older named varieties, which have already been referred to. He then took up iris breeding to improve the flowers, and among plants used as parents was one he called "Asiatica." From one of the crosses with this came the most famous

of all iris varieties, "Dominion." It was famous for its wonderful, stiff form and flaring falls, its very heavy substance, its rich, velvety texture, and for its beautiful, purple color. Its rather clumsy stem, which later was sarcastically referred to as resembling a baseball bat, was not mentioned. Bliss sold the entire stock to Robert W. Wallace who, with the shrewdness of a Barnum, instead of selling it at the usual ten shillings, offered it in his catalogue at the unheard-of price of five guineas — more than $25.00 in our money.

The result was instant publicity, and wonderment that any iris should be offered at such an extravagant price. People who would not have bothered buying it at five or ten shillings immediately wanted it and quickly bought out the small supply. It came to this country in 1918, first to the garden of Mrs. Samuel Taft and Colonel Wareham of Cincinnati. It used to be reported that Mrs. Taft had a standing order with Wallace for ten plants each of every new variety, so he shipped ten plants of the new variety with a bill for more than $250.00, much to the astonishment and dismay of the recipient.



Gathered together at the nursery of R. Wallace & Co., Ltd., Turnbridge Wells, England, during the International Iris Conference in 1922 were: back row, left to right, John C. Wister, W. R. Dykes, Lee R. Bonnewitz; front row, left to right, R. W. Wallace, A. J. Bliss, Sir Arthur Hort, S. Mottet, G. Yeld.

There are many interesting things about "Dominion." One of the first to come to light was the fact that its parent, "Asiatica," had died, and that when Bliss re-ordered it from the nursery which had originally sold it to him, he got something else. He was never able to identify exactly what he had had, but it has been generally assumed that it was "Amas." It is also believed that "Amas," or something very close to it, had been the parent of a previously famous variety of Amos Perry, which in 1900 he had called "Black Prince" (American synonym "Black Knight").

Amos Perry claimed that "Dominion" was either nothing but "Black Prince" or that "Black Prince" was just as good. Most people, however, agreed that "Dominion" was distinct. It was not until it had been in this country a few years that it was discovered that it had the outstanding but unmentioned and unmentionable characteristic of "Black Prince," namely, that it liked to die. But, fortunately, Mr. Bliss and others had used it for breeding, giving rise to the "Dominion Race." Now, after more than thirty years, it is still stated that there are few dark blue-purplish or reddish-purple iris which do not have "Dominion" in their ancestry.

M. Seraphim Mottet, who was in charge of the Vilmorin Nursery under Philippe de Vilmorin and continued, after the latter's death, the firm's work in breeding iris, always maintained that the parentage of "Dominion" and of "Ambassadeur" was identical. It is interesting to look back now and note that three other irises of the time had certain characteristics resembling these. Lionel Millet, living within ten miles of the Vilmorins, had raised the variety, "Souv. de Mme. Gaudichau." E. B. Williamson of Bluffton, Indiana, was supposed to have had "Amas" in his garden when he produced the variety, "Lent A. Williamson" from mixed pollen, and J. Marion Shull of Chevy Chase, Md., was reported to have used pollen from this on *I. trojana* to produce his famous "Morning Splendor."

At the close of World War I, comparatively few American gardeners knew much about iris, and only a small handful knew about the development mentioned above. Bertrand Farr has already been mentioned. Miss Grace Sturtevant, of Wellesley Farms, Massachusetts, came into prominence in 1917 when she won a Massachusetts Horticultural Society medal for her seedlings, "Afterglow," "B. Y. Morrison," and "Shekinah." She and her brother, Robert, and his friend, B. Y. Morrison, began a correspondence with E. B. Williamson, J. M. Shull, Jake and Hans Sass, and Sydney B. Mitchell in this country, and with Bliss in England.

In 1918 and 1919 the circle of enthusiasts began to grow rapidly, and some sixty persons attended the organization meeting of the American Iris Society, held at The New York Botanical Garden, in 1920. This new Society quickly put iris on the garden map. Its bulletins recounted the history of the flower, presented check lists of varieties and standardized descriptions. It eliminated in its test gardens the plague of innumerable synonyms. But most important of all, it introduced its members to each other, and thus spread enthusiasm not only for iris growing but for iris breeding. Today, the Society has grown to over four thousand members, and hundreds of them have taken up iris breeding.

It was quite natural that most of the resulting seedlings were repetitions of what had gone before, and that owing to the vast number of seedlings named and introduced, great confusion often reigned. But among the breeders there began to appear those who studied genetics and mapped out definite programs.

One of Miss Sturtevant's earliest objectives, for instance, was to pro-

The first American Iris Society Test Garden was established at The New York Botanical Garden in 1920. Here are some of the trial beds in 1924.

duce a taller yellow, and one that would thrive in southern California, where the older yellows (of largely *variegata* parentage) were not happy. She planned to produce a yellow with a greater percentage of *Iris pallida* in its parentage. From *pallida* x "Aurea" she produced "Palaurea" and "Afterglow." From "Palaurea" crossed back on "Celeste," almost a pure *pallida,* she produced "Hope"; and from "Hope" selfed came "Shekinah," a distinct break, a fine light yellow resembling in size and stature the fine blue *pallida* varieties of the day. It grew well in southern California.

William Mohr of Mt. Eden, California, studied genetics and came to the conclusion that plicata varieties carried genes he wanted to produce large flowers of many colors. He used "Parisiana," an old Vilmorin variety of seemingly little importance, with Farr's "Juniata" and the species *mesopotamica* to lay the foundations of the famous race introduced after his death by his friend, Professor Mitchell, a race that included "Purissima," "San Francisco," "Los Angeles," "Alta California," "Happy Days," and many others. Foster had produced oncocyclus x bearded iris hybrids by using *Iris iberica, Iris paradoxa,* and others to produce the strange hybrids "Dilkush," "Dorak," "Parsam," "Parvar." They were all, unfortunately, rather frail plants under eastern American conditions, and no one raised second generation seedlings from them. Mr. Mohr, taking the tip from Foster, tried another oncocyclus species, *I. Gatesii,* and crossed it with his favorite "Parisiana." From the cross came the plant Professor Mitchell introduced in 1925 as "William Mohr," a truly sensational hybrid. At first supposed to be sterile like the Foster hybrids, it has now produced children and grandchildren, among them "Elmohr," "Ormohr," and "Lady Mohr," which grow splendidly in the East.

In later years, Miss Sturtevant worked largely for better branching. The Sass brothers early became interested in plicatas of different coloring and in raising varieties suited to the coldest climates.

Col. Wareham worked with the "Dominion Race," produced astounding seedlings for his time, encouraged Dr. Wylie Ayres, also of Cincinnati, and Clarence Connell of Nashville to follow along the same line; and while he held back from naming or introducing his seedlings, they won medals and fame (and perhaps fortune!) with "Meldoric" and "Dauntless." Connell, in turn, interested Chancellor Kirkland of Vanderbilt University and other Nashville neighbors to take up breeding, until Nashville became known as the iris city. From Professor E. O. Essig and Dr. S. S. Berry in California, to Colonel J. C. Nicholls at Cornell and Dr. Robert Graves in New Hampshire, intelligent, careful and enthusiastic breeders set to work. It is not possible in an article of this length to mention all their names. A few more that come to mind are Dr. R. E. Kleinsorge in Oregon, J. H. Grinter in Missouri (he named his most famous seedling for his state), E. G. Lapham in Indiana, Dr. P. A. Loomis in Colorado, F. Cleveland Morgan in Montreal, L. W. Cousins in Ontario, and Howard R. Glutzbeck on Long Island.

What of the nurserymen who distributed the many seedlings? Farr was the first of importance. Mrs. Douglas Pattison in Illinois catalogued and advertised the finest varieties for many

(Continued on page 55)

Iris pallida growing at The New York Botanical Garden in 1906

LOUISIANA IRIS

By Caroline Dormon

Iris giganticaerulea

Not so many years ago, Louisiana irises were growing in black muck-bogs along bayous in wild swamps—unknown and unsung. Now they are garden aristocrats and are flourishing in plantings around the world. In California their growth is amazing, and they are especially happy in South Australia. Most surprising of all, they survive winters in New England and Minnesota, where they flower beautifully in late spring.

The infinite variety of Louisiana irises in the wild is astonishing, even to those who have collected and grown them for many years. No wild flower adventure can ever quite match my excitement on seeing them for the first time. In 1920 I was driving near Morgan City, in the coastal region of Louisiana, when I spied masses of giant iris growing in the ditch-banks. There were enormous flowers of various shades of lavender-blue, violet, and royal purple, on stems four and five feet tall. Not only had I not seen such irises, but I had never even heard of them! When I got home, I rushed to my botanies — but no such species was described. At that time, the only irises credited to Louisiana were little rust-red *I. fulva, I. hexagona,* with blue flowers over-topped by foliage, and *I. caroliniana* (Gray).

There are some queer kinks in the history of these very showy flowers. *Iris fulva* was discovered, named, and introduced into England in 1812, when, because it was a new color for the genus, it created some excitement. Does it not seem strange that no one felt impelled to explore further, for other brilliant-hued irises? Audubon was the first person to refer to a "Louisiana Flag" (Birds of America). Those who observed a rose-colored iris, of flat form, painted with one of his birds, thought it was just "faked" for pretty color harmony!

Prior to 1925, a few observant gardeners in and around New Orleans had been impressed by the fact that they had seen bright-colored irises growing in the swamps. Here and there, venturesome souls donned high boots and collected some of these for their gardens. To these early collectors (and they were few) we are indebted for saving some of the loveliest and best for garden use, for most of these bogs are now filled in and built over by the rapidly spreading city of New Orleans. And what variety! There were pure whites and creams, rose-pinks and brilliant reds, orchid, violet, and black-purple. At that time, it was commonly accepted that these irises were escapes from gardens. "Escapes" from what, where? There were no cultivated varieties like these to be found anywhere in the world!

In spite of all the storm that has raged around Dr. J. K. Small's interpretation of these irises, the fact remains, indisputable, that he was the first botanist to see and recognize them as a new and most important element in the iris family. He grew them at The New York Botanical Garden, had them painted, and the beautiful color plates in "Addisonia" gave the world its first view of these fascinating flowers. He saw them in 1925, then returned to Louisiana for several succeeding springs. He and E. J. Alexander waded the bogs, collected hundreds of specimens and plants, and kept copious notes.

About 1932, a Louisiana gardener who combined a sense of beauty, keen observation, and boundless enthusiasm, began collecting native irises. Over a period of a few years, Mrs. Dan Debaillon, of Lafayette, Louisiana, assembled the most complete collection of Louisiana irises. To her we are indebted for such fine garden varieties as frilly white "Jeune Fille," huge rose-pink "New Orleans," and the orchid bi-tone that bears her name. Most of these came from the vicinity of New Orleans.

In 1937, W. B. McMillan persuaded Mrs. Debaillon to look at some wonderful reds and yellows he had found growing in bogs near Abbeville. She was amazed at the extent of these bogs, at the size and vigor of the plants, and the many new shades of rich red and yellow. Also, the flowers have very broad segments — sometimes overlapping — with almost no claw. Mr. McMillan was largely instrumental in organizing The Society for Louisiana Irises, with headquarters and test garden at Lafayette, Louisiana. It is affiliated with the American Iris Society.

Not only are these irises unmatched as to color-range, but they vary almost as greatly as to size and form. There are midgets six inches high, but with flowers not at all hidden by the slender leaves, and there are blossoms seven and eight inches in diameter, held on five-foot stems. *Iris giganticaerulea,* in shades from white to deepest violet, is near the conventional iris form; others have recurved segments; some are almost flat; while a few are of chalice form. Now when I use the term "Louisiana iris," I do not include *I. caroliniana.* The latter has ridged leaves and tough pinkish rhizomes similar to those of the Asiatic *I. Pseudacorus.* The typical Louisiana iris has fat, tender rhizomes, and smooth light-green leaves, and is easily identified.

Hybridizers recognized the importance of these discoveries and for some years have been making studied crosses. The results have been most interesting, if sometimes surprising, and some very fine garden plants are being developed. Many show their multiple parentage — even when not crossed — by breaking up into various forms and colors, so a hybridizer cannot count on certain results. As an example, I crossed big rose-pink "New Orleans" with "Cajan," a flower of flat

form, in shades of rose, amber, and yellow. One of the progeny was a huge thing and in that blazing violet seen between red and purple in a vivid rainbow. Another was a comparatively small flower, all ruffled and up-standing, in shades of vivid rose. Some exquisite bright yellows have been produced, and a close approach to true soft pink. An interesting development is the tremendous triangular signal-patch that has appeared on some of the new hybrids, usually vivid yellow on velvety violet.

For garden use, they need to be more floriferous, and that quality is coming, too. Many of the new introductions show definite side-branching, and efforts are being made to fix this tendency. The best of the collected forms are faithful bloomers and provide a fine sheet of color. The "Abbevilles" possess great vigor, and the texture of the flower is almost like leather for toughness. For these reasons, I am getting Abbeville blood into most of my crosses. In my best seedlings, the flowers last four days in wind and sun — and some take hard rains without damage.

Dr. Small's theory that the ancestors of these irises came down from much farther north seems to be borne out by their performance. Their native site is a bog in a sub-tropical land — yet they flourish in cold regions. Here, they make their growth in fall and winter and bloom in early spring. Farther north, they simply wait for spring before putting on much growth. Of course, where temperatures drop to zero, winter protection of hay, glass wool, or a muslin frame is required.

Louisiana irises have succeeded under varying conditions, but from thirty years' experience in growing them, my own conclusions can be summed up in a few sentences. The first two requirements are rich soil and plenty of water during the growing season — they certainly eat and drink intemperately! They like soil, either acid or neutral, and must have plenty of humus. Here, in the Deep South, they do not want full sun all day. In their native habitat, they are found growing beneath tall cypresses, the lacy foliage of which sifts in just the right mixture of light and shade. In colder regions, all-day sun is fine for them.

One of the most outstanding features of these irises is their natural grace, and for this reason they are exquisite as cut flowers. The forms with medium-sized flowers and narrow glaucous foliage are best for this purpose. They last well, and every bud opens to full size indoors.

The Louisiana iris has definitely become a garden plant; many of the finer forms have been given names and registered with the American Iris Society. Most hybridizers endeavor to preserve the "Louisiana flavor" by using such names as "Bayou Sunset," "Southern Moon," "Cajan," "Louisiana Purchase," and "Delta Treasure."

The adventure is still not ended. Recently, extensive bogs of giant whites and blues have been discovered in southwest Louisiana. Some of the flowers measure eight inches in diameter and possess remarkable substance. These add another desirable element in hybridizing.

Dealers are beginning to list these irises, but a few make the mistake of terming them all "Louisiana hybrids." This is misleading, for there are some very definite species among the vast array. Just "Louisiana iris" seems fitting, for the most vivid forms of this astonishing flower are truly the creation of this state. And this grower hopes they will never become so "bred-up" as to lose their most distinguishing feature, their exquisite grace. Their origin is shrouded in mystery — but so is their destination.

GROWING SPURIA IRIS on the Gulf Coast

By **Margaret P. Slaughter**

GARDENERS living in sections where the beautiful pogon, or bearded iris thrive, can have little understanding of the benighted state of iris lovers on the Texas Gulf Coast, until we discovered that the graceful swamp iris of Louisiana would prosper here. Twenty years ago, only occasional clumps of wild fulvas, giganticaeruleas, and foliosas were seen, whereas today extensive collections of the fine named hybrids are the pride of our gardens in April.

In addition, for several years now, the sturdy spurias, or butterfly iris, rising in tall accent, have become an integral part of our border planting — a more than welcome addition! Following the Louisianas, they bloom from April into May, thus doubling our iris blooming season. Although the spuria color range cannot compare with the jewel-like shades of the swamp iris, their gamut ranges from white with gold, to yellow, bronze, blue, and lavender, with many combinations of these original colors. Their dependability, with firm-textured blossoms even in unfavorable weather, and the lasting quality of their flowers, both in the garden and in arrangement, certainly endear them to us. In the more recent introductions, notably those of the late Eric Nies and Tom Craig, their petals are broader, in some cases daintily frilled, and stalks more spreading in growth, making them not only more effective in the garden, but superlative for cutting.

In my own garden, I started out cautiously with some of the species, including the white and gold *ochroleuca,* the pure yellow *Monnieri,* natives of western Asia; "Aurea," a not so tall, and sometimes capricious gold, hailing from Kashmir, with two modest hybrids, "Golden Standard," a frilled yellow, and "Miss Eastwood," an improved *ochroleuca.* The dependability of these clumps encouraged me, so long inured to disappointment in growing iris; so each season, as my garden budget permitted, I have added many new varieties, ranging from the early introductions of Barr and Sir Michael Foster in England, through the T. A. Washington and Carl Milliken hybrids, to the ultimate, thus far, in those of Eric Nies, and Tom Craig of California.

This summer, with the organizing of our Spuria Society, sponsored by the American Iris Society and the setting up of a Spuria Test Garden in Houston, with a good forty named varieties already in growth, the local interest in iris grows apace!

In the Society's Test Garden, we

have also a display planting of outstanding Louisiana hybrids. Many of these moderns, with their flat, wide, overlapping petals and crepey textures, carry the strains both in form and exotic color of their exciting forebears, the famous "Abbeville" iris discovered in the swamps around Abbeville, Louisiana. In this planting we have included other beardless types that do well for us, such as the evansias, dietes, and stylosas. Our iris garden is laid out on the grounds of the River Oaks Garden Club Center. The River Oaks Club, along with our own Garden Club of Houston, has generously shared the expense of the entire setup, even to the installation of an overhead sprinkler system.

Drainage is a matter of first import here, with our high humidity and heavy annual rainfall, so these beds were dug out to the depth of eighteen inches, and the loam, compost, shredded peat, and stable sweepings being mixed to a fine, friable texture, were built up well above ground level. As a finishing touch, evergreen borders of lily-turf *(Ophiopogon)* were planted, and the beds left to lie fallow until planting started in October. Then, when sturdy fans of foliage were showing, we mulched them lightly before Christmas with a mixture of peat and vermiculite, topped by pine needles, in anticipation of our sometimes deadly "blue northers." Spurias take time to get established before blooming profusely, and we do not propose to have blooming discouraged.

They are singularly free from disease with us, even when growing adjacent to rust-infested clumps of Louisianas; and they even hold their own against the inroads of the enterprising leaf miner — a great point in their favor!

The Spuria Society's objectives include the good growing of spurias, with a wide display of interesting varieties to delight our visitors, the publishing of a quarterly Newsletter for the membership, as well as instruction at blooming time in controlled crossing, keeping of records, and the growing of seedlings for the future. In this respect we are fortunate, indeed, to have trained hybridizers in our group to guide lay members eager to try their luck in this interesting venture.

WILD IRIS IN OREGON

By **Drew Sherrard**

Some of the happiest field trips I have ever taken were spent in searching for the rainbow of wild iris that brightens western Oregon in May. The season of bloom is mainly in that month, though there are later and earlier species and varieties.

With the exception of *Iris missouriensis* which travels far in the west, they are all found between the west slope of the Cascade range and the Pacific Ocean. *Missouriensis* in Oregon is east of the Cascades, in wet meadows. Transplanted to western Oregon, it does best in moist situations that dry out in summer.

These wild irises have a charm and grace that is hard to convey in words. They are small, dainty flowers, mostly of delicate colors. They grow in such numbers and variety that a meadow, hillside pasture, or open spot among trees may be an irresistible invitation to adventure. When one finds a new color or form, it is a temptation to lift it and try it in the home garden. Better gardening practice would be to take it up later, leaving a plant stake to mark the spot. Only one may not return to that place or, returning, may find that a logging crew or a bulldozer has wiped it clean.

So to get the unusual plant, one must use great care to lift it with root ball undisturbed, and give it water and shade in the weeks that follow. The best time of all is early fall for dividing established plants, and either fall or early spring for transplanting. At those times the plants are making new root growth.

Most widely spread of western Oregon species, and best known, is the lavender to purple *I. tenax*. It has a very wide range of color, varying by locality. In one region the flowers will be nearly all dark purple, in another pink-lavender or blue-lavender; yet in any large spread of the plants, there will be color surprises.

Pure white *tenax* is a rarity that seems to be reserved for the worthy. And once found, there is no use trying to get more plants by the seed method; division is the only certainty. Once I planted a row in the vegetable garden, of seed from a pure white *tenax*. It took three years to get results. When they began blooming, great was the excitement. Not one in a row of thirty was white!

There are found in a few localities bicolor forms, with buff and lavender combined, and the variety *Gormanii*, formerly listed as a separate species, is light yellow, cream or occasionally bicolored, with lavender falls. Grown in the garden beside *tenax*, it is easy to see that *Gormanii* foliage is a bluer green, and its blooming nearly two weeks after that of the typical *tenax*.

Iris tenax varies in height and size of bloom as well as color. Some plants will have six-inch flower stems, and in the same bit of ground there will be eighteen-inch stems.

In 1929 a friend brought me a specimen of a dwarf yellow iris unknown to me, which he had found near the Rogue River. It was later named and described by Professor Henderson of the University of Oregon as *Iris innominata*. The first botanical collection of it was made by Mrs. John R. Leach, discoverer of *Kalmiopsis Leachiana*.

My two specimens — I divided the plant, to be more sure of saving at least a part of it — grew and bloomed the next spring. A portion given to an iris grower was exhibited in Portland and won a prize in the rare plant class. Soon it reached England and won there the gold medal of the Royal Horticultural Society. This is a most beautiful iris, and now popular with rock gardeners. In severe climates it can be grown as a pot plant in a cool greenhouse. The color varies from the beautiful clear yellow of my first little plant to lighter and darker yellows, some pencilled in dark brown or purple, some tawny gold. Dr. Matthew Riddle of Portland has more colors in this iris than anyone else, for he has followed the iris trail in southwestern Oregon and brought back very unusual forms and colors. One is very nearly red.

Still another yellow species is *I. bracteata*, from the dry open pine

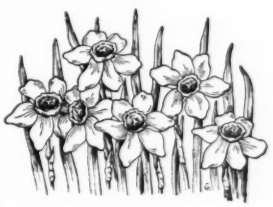
woods of southern Oregon. The color is a soft apricot to buff-orange, much pencilled with brown. Where it runs into the territory of other iris species, for instance, *Douglasiana,* there are exciting intermediates scattered about, with *bracteata* foliage and form, but lavender and rose coming into the yellow flowers. Once in a blue moon there is a white *innominata,* but I have never heard of a white *bracteata.*

In the Siskiyou Mountains there is a species or perhaps a group of species, called by the natives the little white iris. It is not pure white as far as I have observed, but varies from yellowish to bluish white. The color seems to be a thin wash spread over the falls, which are heavily veined in darker color; the standards are creamy. This is called *I. chrysophylla,* and it is very like *macrosiphon* and *californica.* All have very long perianth tubes and long stigma crests. Some plants have the flower borne on the end of a short stem, two to three inches long, and some have no visible stem, the flower appearing to sit right on the ground among its long leaves.

Rare and delicate is the smallest iris of all, *I. tenuis,* found along the watersheds of two Oregon rivers, the Molalla and the Clackamas. Growing wild among the decaying litter of needles under the Douglas firs, it sends up rather broad, bright green leaves that die down in winter. The dainty white flowers, picked out in purple and gold, are borne on very slender, erect stems. They are rather scattering among the leaves, but brought into the garden, where they get more sun than in the deep shade of the timber, the flowers are doubled in number.

The fun of looking for wild irises is always intensified when one is passing out of the range of one species into that of a different one. The intermediate territory has plants in it that are anybody's guess. Some of the most attractive of these natural hybrids that I have found were between *innominata* and *chrysophylla* range and down at the coast where yellow *innominata* dwarfs meet blue to purple, tall, stout *Douglasiana.* The plants found and collected in these two regions have mainly yellow or soft apricot petals, with falls of other colors, porcelain-blue or rose or lilac. The foliage is intermediate between the narrow blade of *innominata* and the broader leathery leaves of *Douglasiana.*

At least one Oregon nurseryman, Fred De Forest of Monroe, has done some hybridizing of western species. The late Professor Sydney Mitchell said he considered the western irises a possibility for hybridizing, but not very good garden material in their natural state because of the small size of the flowers and their somewhat temperamental behavior in being moved or divided. But for the wild flower enthusiast, these very drawbacks add to their charm.



SOIL CONDITIONERS (from page 47)

be greatly reduced by surface treatment to eliminate bad crusting of the surface. As time passes, we will hear of still other uses for the synthetic conditioners.

What Soil Conditioners Will Not Do

Perhaps it would be well to list a few of the jobs a synthetic soil conditioner will not do, despite colorful advertising to the contrary.

They will not:

1. Improve or aggregate a sandy soil (containing no clay whatsoever). Sand has no base exchange capacity and hence cannot be tied together as can clay.

2. Improve poor drainage caused by subsoil hardpans, rock ledges or seepage.

3. Supply any plant nutrients. The soil must still receive a completely balanced chemical fertilizer.

4. Improve to any measurable extent soils already containing an abundance of organic matter. They have no effect on highly organic soils such as peat or muck.

Finally, I would remind some gardeners that although synthetic soil conditioners can be substituted for organic matter, there is no substitute for good soil management. Also that despite all this fanfare and publicity — some good, most of it bad — I am certain of one thing and it is this: just as the announcement of penicillin has spurred research and resulted in the discovery of newer and better antibiotics, so too the announcement of Krilium will result in the finding of new, useful related compounds.

IRIS HISTORY (from page 51)

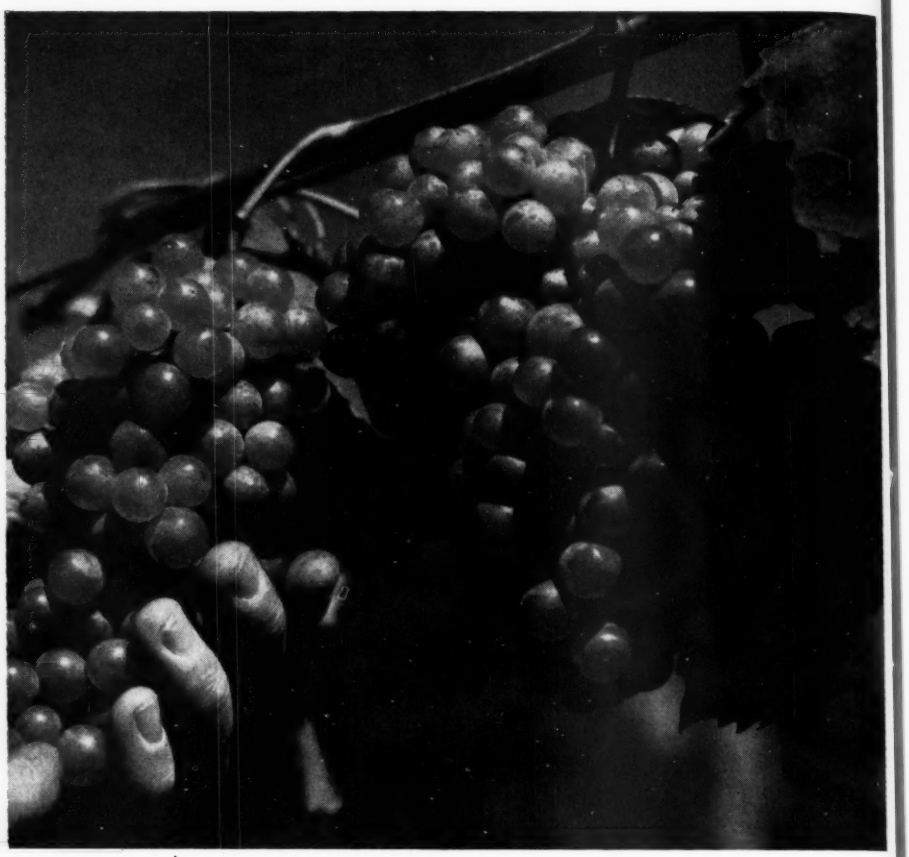
years, and made the iris shows of her home town nationally famous. Salbach in California, Weed and Cooley in Oregon, Scheiner in Minnesota and later Oregon, Wayman on Long Island are others who should be mentioned.

During the early 1920's, Wallace, Perry, and Orpington were the headquarters of English varieties, Vilmorin, Millet, Cayeux, and for a short time Maron, who handled the "Ricardi" hybrids of M. F. Denis, represented the French breeders. Germany made few contributions after the first World War.

This article has been concerned with bearded iris only. The history of the bulbous iris industry in Holland would be shorter, though the actual number of plants produced would be enormous. The history of other sections of iris, even of the sibericas and Kaempferis, would be comparatively short during the period I have covered, but has been growing in importance these past ten years.

The hundred or more years of bearded iris growing that ended about 1935 has been covered with a hop, skip, and jump, but with, I hope, enough detail to form a background and to show how the ground work was covered for the astounding development of the past twenty years. No one is better qualified to tell of this period than Kenneth Smith, who will handle this difficult and fascinating assignment in the May-June 1953 issue of The Garden Journal of The New York Botanical Garden.

Foot-note: Colonel Stern in his article on "Cytology and Horticulture" in the December 1952 issue of the "Journal of the Royal Horticultural Society" says on page 440: "All flag irises up to 1895 were diploids with twenty-four chromosomes. Sir Michael Foster imported in the '80's several wild species that were tetraploids, with forty-eight chromosomes. By crossing these with the garden plants, the modern race of tetraploid flag irises arose." "Dominion" and "Lent A. Williamson" both have fifty chromosomes instead of forty-eight. Colonel Stern also goes into the technicalities of the cross that produced "William Mohr."



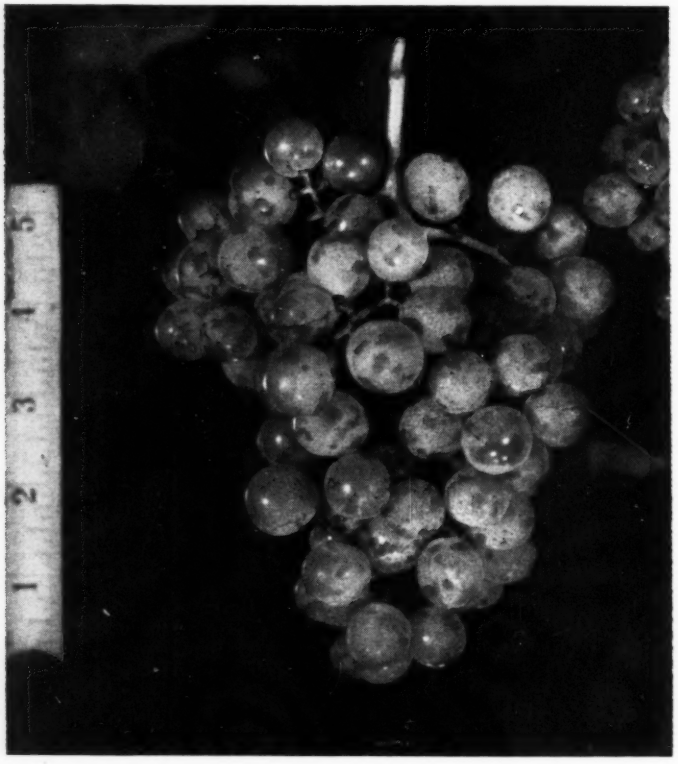
Romulus is one of the seedless grape varieties obtained in a cooperative grape-breeding project between The New York Botanical Garden and the New York Agricultural Experiment Station

New Seedless Grapes

By A. B. Stout

Two seedless grapes have recently been named Himrod and Romulus by the New York State Agricultural Experiment Station ("Farm Research," October, 1952) and are now being distributed for general culture. These are of the seedlings obtained in a cooperative grape-breeding project between The New York Botanical Garden and the Experiment Station. This part of the breeding program was organized in 1920 by the writer, who was active in the work until his retirement in 1947.

During that time a special study was made of the nature and heredity of seedlessness, of which there have been several publications. A total of three hundred fourteen seedlings were obtained that bear seedless or near-seedless fruit. Five of these have now been named as clonal varieties, and about twenty-five of the best and most hardy of the seedlings have been under test in grape-growing districts in New York and elsewhere.



The clusters of Himrod seedless grape are large, tapering, and compact; the berries are greenish-yellow and vinous in flavor

The Himrod seedless grape has berries that are of medium size, oval, greenish yellow, melting, tender, and vinous in flavor. The clusters are large, tapering, and compact, and they ripen during the first week of September.

The Romulus seedless grape bears clusters that are large, shouldered, and compact. The berries are smaller than those of Himrod, more round, greenish yellow, juicy, sweet, and vinous-flavored, and of good quality. The fruit ripens in mid-September.

These two new grapes are sister seedlings obtained in 1928 from the cross between the hardy early Ontario seeded grape and the Sultanina or Thompson Seedless grape that has long been known in southern Europe and is widely grown in California. These two seedlings have a degree of hardiness which far surpasses that of the tender Sultanina and approaches that of their seed parent, a necessary characteristic for a grape suitable for the grape-growing areas of New York. The berries have some of the desirable qualities of the Vinifera grapes of the Old World. They are "meaty," instead of having a slip-skin character, and the sweet vinous flavor extends throughout the flesh, and the absence of seeds is especially to be desired.

POINSETTIA, TAPIOCA and CASTOR OIL

all from one plant family

By **Edith Farrington Johnston**

WHEN an elephant falls ill, so THEY used to tell us when we tried to beg off from taking our dose of castor oil, he is given an oil far more potent and far "worse-tasting" than mere castor-oil. But the elephant is a wise and sagacious beast and makes no fuss about taking his oil. The name of it is croton-oil, and it comes from the same family as our dreaded castor-oil — the spurge family, Euphorbiaceae. And strange as it seems, both croton-oil and castor-oil are first cousins of the gorgeous scarlet poinsettia that brightens our Christmas holidays.

All the spurges in the world, some thousand species, bear minute, unnoticeable greenish or yellowish flowers. But no, you will say, the poinsettia, as everybody knows, flaunts large gaudy blossoms of brilliant red. It does look that way, to be sure. But the lovely colored parts are bracts surrounding the insignificant little yellow-green flowers; they are not flowers themselves. Look at the middle part of a poinsettia-flower through a magnifying glass. You will find all the essential flower parts there and, in addition, small cup-shaped glands filled wtih nectar. The nectar lures insects to settle there, after the scarlet bracts have attracted them to the plant. In Florida or other warm spots, and in Mexico where it grows wild, the poinsettia sets seed in three-parted seed capsules.

The poinsettia first began to be appreciated by the United States about 1825, when Joel Poinsett was American ambassador to Mexico. The plant was named for him and began to be grown by northern florists. Now, as you know, it is our most popular Christmas plant. Recently, growers have persuaded some poinsettias to produce a multiplication of the showy bracts, like a tuft of brilliant feathers around the central flowers.

Throughout the South, the poinsettia has many spurge relatives of a humble sort growing wild. One small unlovely cousin found along country roads and in waste places in the South is called cancer-weed or, sometimes, healing croton *(Croton argyranthemus)*. Country folk who prize its virtues cut the fresh stems and let the milky sap, characteristic of spurges, drip onto cuts, scratches, or other open wounds, which thereupon heal without trouble — so they say. Maybe this sounds like one of the groundless superstitions prevalent in lonely places, but it has a common-sense basis. The sticky sap forms a water-proof coating over the injury and protects it against germs and fungi, whether or not it contributes any healing principle.

But if belief in the "healing croton" does have its foundation in common sense, there is a tale told about another spurge *(Euphorbia marginata)*, called "snow - on - the - mountain" from the white-edged to pure white bracts that subtend the blossoms, which has all the earmarks of one of the "tall tales" told to tourists in the West. Visitors to cow-country are told that this spurge was used in the old days for branding cattle. Milky sap from the cut stems was applied to the calves' skins in the shape of the brand desired. As it dried, it burned away hide and hair, leaving the brand permanently bare. I am forced to doubt this tale. When I was a child in the Rocky Mountains, I often carried home large bunches of "snow-on-the-mountain." Beyond a sound scolding for the sticky gum that encrusted my hands and clothes, no ill result followed. And, anyway, why should any cow-poke prefer so tedious and doubtful a method to the swift and decisive action of the branding-iron?

Sometimes, "snow - on - the - mountain" grows four feet tall and the taproot that anchors it against the winds is almost as long. This handsome spurge is common in the West and Midwest.

Another tale hard to swallow is the southern one about the spurge-nettle *(Cnidoscolus stimulosus)*, a most unspurge-like "flower" to look at. "Tread-softly," they call it in the South and say, "Look right hard at that thar nettle and she won't sting." I was never able to look hard enough. Its innocent-eyed, white, starry "flowers" gaze up so charmingly from its dark green, thorny leaves, along roadsides and neglected fields, it seems to invite you to pick a bouquet. But don't! It is a wicked small demon in disguise. It is covered with fine sharp spines like splinters of glass, which not only pierce the skin but inject an irritant poison, that will make you sorry you touched it for a long time.

"Hypocrite" is the southern name for another small spurge *(Euphorbia heterophylla)*, common in weed-lots and fence-corners. And a hypocrite it is, because toward the top of the stem its leaves deck themselves with scarlet diamonds, becoming larger and larger as they ascend, until the topmost leaves (or should they now be called bracts?) are so red and pretty as to look like flowers. It is interesting to study, because this small spurge looks like one of the first crude experiments leading up to the creation of the gay Christmas poinsettia, which also starts its reddening with a mere red midrib on a green leaf. Above that, a small red diamond-shaped patch, and with each ascending leaf the red grows larger and brighter until the upper leaf or two show pure scarlet. Thereupon, the plant bursts into a paean of scarlet bracts culminating in its tiny flowers.

Several small native spurges are useful in one way or another. One *(E. Lathyrus)* is called "gopher-spurge," because it is planted to drive away moles and gophers — "gophers" are rodents in California and other western states, though in the South they are land tortoises. Housewives pickle its immature seed capsules to use like capers and then call it "caper-spurge." The ripened seeds are often taken as a cathartic.

Flowering spurge *(E. corollata)*, grown frequently as an ornamental plant in gardens, has a long thick root-

stock which Californians, Floridians, and others collect for its medicinal properties. The milky sap of all our small wild spurges is called by a variety of uncomplimentary local names: cat's-milk, wolf's-milk, mouse-milk, devil's-milk, mad-woman's milk.

But it is in the tropics that the spurges show their real versatility. Castor-oil of unhappy memory comes from an African spurge *(Ricinus communis)*. Croton-oil is taken from a small tree-like spurge *(Codiaeum tiglinum)*. Other tropical spurges are the gaudily spotted, striped, and streaked foliage plants called crotons, which look as if they had stood underneath the ladders of all the house painters in the world and had received drops and spatters of every color. They are much used in the South for ornamental plantings and in the North as hothouse specimens. Madagascar sends us the decorative plant called "crown-of-thorns" *(E. splendens)*, with cactus-like branches and "flowers" (really bracts) of the purest light scarlet, a shade so glowing that it seems half color and half sunlight. Another spurge displaying the same light scarlet with paler tones is *Pedilanthus tithymaloides*, a succulent plant of tropical Central and South America, called variously "devil's backbone" from its angular stems, "angel's slipper" from the odd shape of its involucres (structures surrounding the flowers), or "red-bird cactus." Still another ornamental tropical spurge is the *Phyllanthus* (leaf-flower), common in southern gardens, where they call it "Joseph's coat," because of its many colors, of course. Two species of *Phyllanthus, P. acidus* and *P. Emblica,* produce small edible fruits used in the tropics and in southern Florida, where it has become naturalized, for making preserves.

One of the most curious spurge blooms is that borne by the "chenille-plant" *(Acalypha hispida)*. There are many forms of *Acalypha* grown for their rich-colored foliage. One species has large blood-red leaves like slices of dried beef; others have leaves of bronze-green variegated or edged with red, purple, or bronze. Gardeners usually nip off the flower buds to promote the increase of the showy leafage, but *A. hispida* is encouraged to bloom for its long drooping tails of crimson to purple bracts which surround the tiny flowers. These are all too easy to copy in chenille. Sometimes small shops of the less sophisticated sort bedeck themselves fearsomely with factory-made synthetic "chenille-flowers." They look like some mad decorator's version of flowers "that never were on land or sea." But in the southern states you may see the originals flourishing in the open air, looking quite as improbable as their chenille imitations.

Tapioca is made from a spurge that grows in tropical Brazil, the cassava.

Poinsettia *(Euphorbia pulcherrima)* was introduced to this country from Mexico

Since prehistoric times this spurge, called manihot *(Manihot esculenta)* by the natives, has been cultivated for food. It is a perennial shrub with a seven-parted leaf resembling that of its cousin, the castor-bean. At the base of the stem grows a cluster of big fleshy roots filled with starch. Unfortunately, the roots contain Prussic acid, too, and are not at all wholesome to eat in the raw state. But the natives — who knows through how many centuries of trial and error and frequent tragedy — have hit upon a method of removing the poison by heating and pressing out the poisonous juice, so that the resultant product is edible and nourishing. Made into pellets, it is sold as tapioca; in flour form, it is called Brazilian arrowroot. This "bitter cassava," while native to South America, has been introduced into most tropical regions and is much cultivated in tropical West Africa and the Malay Archipelago. In warm parts of the United States, its near relative, the non-poisonous "sweet cassava" is sometimes grown as feed for stock.

And not content with producing showy foliage plants, gay flowers, medicinal oils, fruits for preserving, edible starches, and other useful or beautiful products, this versatile plant family, the spurge family, also supplies us with rubber. Along the sloping clayey banks of Brazilian rivers, the sixty-foot trees called *Hevea brasiliensis* flourish. In the early mornings of the "dry season" (June to February), the trees are tapped and the milky juice, latex, is collected and processed into "Para rubber." Seedlings of these trees were collected by the British Government and planted in the Federated Malay states and Ceylon, and in Java, Sumatra, and Borneo. In all these new locations *H. brasiliensis* has done well, though plantings in India were not so successful.

Tung-oil is another important product from a member of the spurge family, *Aleurites Fordii*. It occurs as a large tropical tree and is now being grown in regular plantations to supply the growing demand for tung-oil.

In the desert regions of tropical Africa and the Canary Islands, species of spurge occur which look like cacti. They have thick fleshy stems and leaves reduced to spines. Long ago, ancient manuscripts praised the virtues of "euphorbium gum," a brownish resin soluble in alcohol, ether or turpentine. It was highly regarded by the ancients as a purgative and emetic and was obtained from some of the perennial cactus-like spurges of Morocco.

Many species of spurge are poisonous, some to the touch, others if swallowed. The South African *Toxicodendrum** is one of the most poisonous plants known. Long ago, when I first visited the tropical greenhouses of The New York Botanical Garden, I felt a deep and satisfying thrill upon reading a warning sign posted in the house where various tropical spurges were collected: "Visitors are warned against touching these plants. They are poisonous." It brought to mind tales of the villainous "poison-tree," which slew the unlucky campers in its shade by distilling poison on them all night

long, and of the vicious sentient "strangling-tree," which could extend its hungry arms and suffocate the weary traveler as he rested.

It is strange to think about — that our gay Christmas poinsettia has as near relatives spurges which give us castor-oil, croton-oil, and the tung-oil so valuable to industry; tapioca, stock-feed, fruits for preserving; laxatives, gums for medical use, and an emetic used as a substitue for ipecac; rubber for tires, boats, air-beds; foliage plants, garden flowers, and a rodent-poison.

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*Not to be confused with *Toxicodendron*, which is the genus of poison sumac or poison ivy, a member of the Anacardiaceae. *Toxicodendrum capense* is known as "Hyaena Poison" and "Kaapsche Giftboom." It is sometimes placed in the genus *Hyaenanche* (name from the Greek *hyaina* + *anchein*, to strangle).

FOREST PRESERVE (from page 39)

now facing our nation, it is imperative that these trees be salvaged and their products made available for defense needs, and desirable at the same time to reduce the expense the state will necessarily be put to in removing this menace to the Forest Preserve."

In accordance with this opinion and following a special message from Governor Dewey, the Legislature on January 16, 1951, enacted a statute amending the Conservation Law to give the Department the necessary authority to proceed with the salvage work. (Who says democracies can't act fast in an emergency!)

The cleaning-up of the "Blowdown," however valuable for the present welfare of the Forest Preserve, is limited to a five-year project and does nothing to settle the long-time policy questions, which had for some time been giving Department officials serious concern.

Thus, during the latter part of 1951, Commissioner Duryea, exhibiting the courage which has characterized his administration, decided to re-open publicly the whole subject, through the pages of "The New York State Conservationist." Advance notice of this was given by an editorial in the October-November issue, and in a succeeding issue four questions were discussed by members of the staff:

1. If our objective is the preservation of our forests, are forests best preserved by prohibiting cutting?

2. What is meant by "forever wild?" Does it suggest an abundance of birds and animals, and if so, does our present management policy promote that objective?

3. How does the present management policy, as prescribed by our constitution, contribute to the economic needs of State and Nation?

4. Under this policy, are we making the most of the potential recreational values of the Forest Preserve?

In answering the questions assigned to them, the foresters and wildlife technicians pointed out that insofar as the productivity of the Forest Preserve lands was concerned, more and better timber and an improved habitat for most forms of wildlife might be obtained under forest management than by "leaving the woods alone," though admitting that some sections, like the "High Peaks," ought to be kept undisturbed as far as possible because of their extraordinary scenic and watershed values.

The reaction to these articles, both by the public press and by individuals, was prompt and in some cases violent. The pages of the "Conservationist" were opened to conservation experts, spokesmen for lay conservation groups, and others who cared to participate in this forum. The discussion has attracted the attention of Senator Wheeler Milmoe, Chairman of the Joint Legislative Committee on Natural Resources, to such an extent that he has appointed an eighteen member Advisory Board to study the Forest Preserve question. On this Board are individuals representing just about every phase of opinion and every interested group, so that when their findings are presented, those who govern the Empire State and administer its natural resources, will have a substantial basis for future action.

BULBS

Safe in the earth they lie, serenely waiting,
They never speak to north winds or to snow.
Perfume and color in the dark creating,
Fit for the sunlit world that they will know.

I held them in my hand, small balls of wonder,
Purple and ivory and brown.
I broke the soft dark earth to fold them under
And pressed the yielding soil to hold them down.

I know that in their hearts the rainbow lingers,
Waiting until it hears a song it knows.
Oh, strange — to hold a rainbow in my fingers!
It lies there waiting for the melting snows.

And long before I hear the bluebird singing,
Truth will be stirring in my garden beds.
And oh, it will be early that I'll find there
Small, green-hooded heads.

LOUISE DRISCOLL

At a meeting of the Board of Managers of The New York Botanical Garden held January 29, 1953 the following resolution was adopted:

In Memoriam
J. MARK KERANS

In the death of Mr. J. Mark Kerans on December 10, 1952, The New York Botanical Garden has lost a man whom all have learned to respect and esteem. Mr. Kerans joined the staff of the Garden as Administrator on June 1, 1950, and, although his service was comparatively brief, he brought to its councils an enthusiasm and keen judgment which resulted in many improvements. Especially is this noticeable in the good relations existing amongst the employees. His genial presence and unfailing good nature will be greatly missed.

Therefore be it

RESOLVED, *that the Board of Managers hereby expresses its deep and sincere sorrow at the death of Mr. Kerans and its sympathy for his family, and directs that this resolution be spread upon the minutes of this meeting and that a copy be sent to the family of Mr. Kerans.*

BOOK REVIEWS

PLANTS OF THE BIBLE. Harold N. and Alma L. Moldenke. 364 pages, 95 illustrations; indexed. Chronica Botanica Co., Waltham, Mass.; Stechert-Hafner, Inc., New York. 1952. $7.50.

Ardent curiosity about plants mentioned in the Bible has long been a popular, vicarious approach to the Scriptures. This curiosity satisfied, it is presumed the reader will go on farther; but it has its limitations, a knowledge of what kind of wood and from what tree came Aaron's rod carries no guarantee of continuing devotion to the Word. However, better that way than not at all.

Over the years, in fact since 1566, many books on this subject have appeared, some profound, others superficial. The present volume leads them all for botanical erudition, systematic arrangement, and breadth of scholarship. It also contains a plenitude of legends and cross-references. Its sufficiency of illustrations is drawn from ancient documents, books on Palestine, and classical botanies. The indices are especially generous and thorough.

It is gratifying to find that the burning bush was doubtless none other than our old garden curiosity fraxinella. Again and again we encounter such familiar plants given recognition, which makes the reading as pleasant as it is informative. But the Old Testament juniper turns out to be a species of broom and not a true juniper. Thus Dr. Moldenke sets us straight. And the shrittim wood, so often found in Exodus for temple construction, was an acacia, native to arid Palestine areas. Our own curiosity was satisfied in having this explained.

Every garden club should add the Moldenkes' volume to its library. And what a welcome present it would make for your pastor, especially if he is garden-minded, as so many of the clergy are.

RICHARDSON WRIGHT
West Chatham, Mass.

GARDENS OF THE ANTILLES. John V. Watkins. 244 pages, illustrated, indexed. University of Florida Press, Gainesville, Fla. 1952. $3.75.

I wish that Mr. Watkins' delightful travel book for gardeners had been available seven years ago, when I first came to live in the Antilles. THE GARDENS OF THE ANTILLES has a wealth of non-technical material easily digested by the layman. When you first land in this area, you are overwhelmed by the strange and completely unidentifiable tropical plants. Nothing you have ever seen before, except for a few house plants, prepares you for the exotic forms and new scents. The colors are fantastic, even outrageous to someone from a northern climate. You quickly learn the names of a few of the garden plants and then you reach a blank wall, unless you are lucky enough to find that very small handful of knowledgeable humans. Often you find the local identification, though generally accepted, is not correct.

Mr. Watkins describes his travels through Cuba, Jamaica, Haiti, the Dominican Republic, and Puerto Rico. He gives you such useful information as the kind of clothes to bring, the most appropriate method of transportation; the special foods and fruits to eat, as well as his feelings about the kind of hotel accommodatons he enjoyed. He tells you of the beautiful drives, parks and gardens, and how the plants are used in these places. And you begin to have some understanding as to why the people have the kind of gardens they do and accept their lack of interest in all-over garden design, and value their special interest in color and fragrance.

In the last fourth of his book, Mr. Watkins covers St. Thomas and the Leeward and Windward Isles, which includes among others St. Kitts, Antigua, Dominica, Martinique, Barbados, St. Vincent, Granada, and Trinidad. He tells of the early botanical gardens established by the crown on so many of the English Islands. And he made me wish it were only possible to see all the Islands mentioned. Included at the end is a check list and a bibliography, both of which seemed extremely useful to me.

HONOR TRANUM
Charlotte Amalie
St. Thomas, V. I.

PLANTS, MAN AND LIFE. Edgar Anderson. 245 pages, illustrated, indexed. Little, Brown & Co., Boston, Mass. 1952. $4.

A popularly written scientific account of what is known and what is not known of the origins of many of our important crop plants. Man has carried certain food plants with him in his treks around the globe from earliest times. Inadvertently, he has taken along at the same time many weeds of no importance to him. These fellow travelers of the plant world have succeeded in varying degrees in their new habitats and have intercrossed with the natives there when this was possible. Intervening centuries have obscured their origins, until at the present time it takes real detective work to reconstruct their histories. Dr. Anderson gives us a most entertaining account of the problems thus presented and of some of the interesting clues that have been followed to bring the often shady pasts of these plant vagrants to light.

DAVID D. KECK

THE IMMACULATE FOREST. W. R. Philipson. 223 pages, 32 illustrations, 2 maps; indexed. Philosophical Library, New York. 1952. $4.50.

This is the story of a recent expedition to the Macarena Mountains which lie in eastern Colombia, sandwiched between the peaks of the Andes and the jungle of the Amazonian Basin. It is an exciting tale of adventure in one of the remaining unexplored, untouched segments of the world. Dr. Philipson has captured very realistically the first impressions of the jungle on a group of men as they learn its secrets. The reader may actually experience the oppressive gloom of the lowland forest, the savagery of unrelenting swarms of salt-hungry and blood-thirsty insects, and the fatigue of mind and body in the struggle of man against jungle.

The author is a botanist of note and the book reflects his keen interest in botanical matters. But it also reveals him as a biologist; such diverse topics as geology, habits of leaf-cutter ants, control of yellow fever, and human relations are discussed with equal enthusiasm. The style of writing is extremely simple, and the writer has obviously devoted particular attention to making the story readable for the non-biologist.

The paper used is not of especially good quality, but this drawback is more than offset by the excellently reproduced, well-chosen photographs illustrating the book. Those concerned with the biology of tropical America and, indeed, anyone with the spirit of adventure will find this a thoroughly enjoyable piece of writing.

RICHARD S. COWAN

VEGETATION OF THE SONORAN DESERT. Forrest Shreve and Ira L. Wiggins. 192 pages, 27 maps, 37 plates. Carnegie Institution of Washington, Publication No. 591, Vol. 1. 1951. $3.25 paper bound; $3.75 cloth bound.

As volume one of a two-volume publication under the general title of VEGETATION AND FLORA OF THE SONORAN DESERT, there has now appeared this comprehensive ecological study of the Sonoran Desert by the late Forrest Shreve. This desert, which covers much of southern Arizona, the Colorado Desert of southeastern California, and most of Baja California and Sonora, is the most arid of the four North American desert areas.

Dr. Shreve, stationed at the Desert Laboratory of the Carnegie Institution of Washington, at Tucson, Arizona, from 1909 until his retirement in 1945, and continuing his work until his death in 1950, brought to this work the most intimate knowledge of the plant communities of the Sonoran Desert thus far obtained. The present volume describes these communities, their distribution and habitats, comprehensively. One gains a mental picture of the Sonoran Desert as a whole from this account of its varied plant cover. Excellent distribution maps and photographs of the vegetation add to the story.

The plant names are in accord with those used by Professor Ira L. Wiggins in the second volume of the publication, which will cover the flora of the region.

DAVID D. KECK

JOURNAL OF RESEARCHES INTO THE GEOLOGY AND NATURAL HISTORY OF THE VARIOUS COUNTRIES VISITED BY H.M.S. BEAGLE. [Facsimile Reprint of the First (1839) edition.] Charles Darwin. 615 pages, 16 plates; indexed. Hafner Publishing Co., New York. 1952. $7.50.

"When on board H.M.S. 'Beagle' as naturalist, I was much struck with certain facts in the distribution of the inhabitants of South America, and in the geological relations of the present to the past inhabitants of that continent. These facts seemed to me to throw some light on the origin of species." This comment from the introduction to the ORIGIN OF THE SPECIES is sufficient reason for any biologist to read Darwin's observations during the Beagle's five-year-long world trip. Apart from its scientific interest, however, the JOURNAL merits reading as a travelogue of the highest order — a young man's view of the fascinating frontiers of the nineteenth century world, with its people, politics, and natural history. Darwin's interests encompassed everything from the temperance and morals of Tahitians to wasp-killing spiders and the structure of lagoon islands.

Dr. Verdoorn's selection of this book as the second of Pallas' offset reprints was an especially judicious one, due to the rarity of the first edition; the addition of sixteen plates from the King and Fitz-Roy accounts of the expedition and a diagram of the Beagle add still further interest to an attractively composed volume. "Nothing can be more improving to a young naturalist than a journey into distant countries" — thus was prophetically concluded the narrative of what was to prove the most remunerative scientific *Wanderjahre* of history.

J. J. WURDACK

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AMERICAN TREES. Rutherford Platt. 256 pages, illustrated with drawings by Margaret L. Cosgrove and photographs and color plates by the author; indexed. Dodd, Mead & Co., New York. 1952. $3.50.

This book is just as attractive and as interesting as one expects Rutherford Platt's books to be. It is also very stimulating, and naturalists of many years' standing will find much in these pages they did not know before.

Mr. Platt makes his survey of two hundred seventy-four trees in the United States an exciting tour of discovery into seven regions — or rather, five regions and two subdivisions. The longest expedition takes one through the vast stretch of country between the Atlantic coast and the Rockies, designated here as The Great American Woods. First considering the oaks, maples, and elms of these eastern forests, the author goes on to search out other groups in an informal arrangement. Ordinarily, one would not look for American holly under magnolias, for sassafras with the undercover trees, nor for sorrel-tree with the middle western group, but an unusually complete index helps to solve such perplexities quickly. Plant names are carefully managed for the most part, and Mr. Platt very justly and sensibly gives duplicate common names when custom and traditions support them.

Southern Florida, the Northwest, California, and the Southwest are treated as separate regions, and with other geographic groupings, the book promises to be of particular value to travelers and sightseers. To assist further in this capacity, eleven pages of cleverly devised tabulations and drawings permit amazingly rapid identification of many common trees. These tabulations and other features as well should make the book especially valuable to young people and anyone just learning to enjoy trees, but its usefulness is certainly not limited to any group.

Especially valuable is the mention of special traits peculiar to the important trees—details of bark, habit of growth, flowers, fruits, or domestic uses, which the author's unusually perceptive eyes and his very refreshing enthusiasm have uncovered to him. Now and then, of course, one ventures to differ, as in disagreeing with his "lumpy, coarse appearance" of larch branches (Mr. Platt usually writes branches when he means branchlets), or in granting redemption to such a depressing weed as box-elder by the phrase "America's most agreeable tree." Box-elders' value in the Plain States must be recognized; but in regions where valuable trees can be grown, these pestiferous poor-relations of the maples are about as agreeable as poison-ivy.

Margaret L. Cosgrove's skillful drawings and Mr. Platt's superb black-and-white photographs illustrate the book handsomely.

BEN BLACKBURN
Gladstone, N. J.

THE BEST LOVED TREES OF AMERICA. Robert S. Lemmon. 253 pages, illustrated, indexed. Doubleday, Garden City, N. Y. 1952. $3.50.

A fine bundle of interviews with some fifty-nine of the author's best-loved American trees, ably written and beautifully illustrated.

As an invitation to the American sylva we think it's "tops" — a labor of intelligent love and observation, presented in terms of restrained appreciative description, with just the right degree of dignity and without technical *chevaux de frise* or lyrical outpourings.

A book as good as this not only elicits praise, but stirs comment as well. For instance, one notes that most of the subjects are presented in maximum development as individual trees in the open. Bob's American beech — handsome matron, to be sure — may leave one yearning for the youthful, slender, elfin ballerina of the woods.

On the other hand, we like his mature red-cedar and his observation that the cone-shaped crown is an ultimate development of the earlier, narrow, columnar habit— a fact which has escaped the attention of some botanical writers on the northeastern red-cedar.

About birds and berries of this red-cedar — this reviewer has never seen a bird eat them until they are fully matured, which, in the Mid-Hudson Valley, is just about Christmas. They are, then, usually cleaned up in one fell swoop of some marauding band of "blackbirds," that spend their winter nights behind rooftop sign-boards in the towns.

No comment of this kind will tend to detract from one's appraisal of the book as a first-rate contribution to the literature of American trees.

PETER J. VAN MELLE
Poughkeepsie, N. Y.

THE LORETTE SYSTEM OF PRUNING. Louis Lorette. 239 pages, translated from the French by W. R. Dykes; illustrated. Rodale Press, Emmaus, Pa. Newly revised with the Eighth French Edition, 1951. $3.

The "Lorette" system of pruning, as its title implies, is the system developed and practised by the late Louis Lorette while Curator of the Practical School of Agriculture at Wagnonville, Douai, France. It is one of the several methods of pruning followed for years in Europe, mainly on dwarf fruit trees and particularly on apples and pears. M. Lorette's work is almost solely confined to pears and refers chiefly to trees trained in a geometrical manner.

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The object of this pruning system is to confine a tree to a limited skeletal form of branches, produce fruiting laterals or spurs (although the term is not used in Lorette's book) directly on these main branches, restrict the size of the tree to definite limits, induce fruiting at an early age and in quantity throughout the life of the tree.

There has in the past and still continues much discussion as to the relative merits of the different pruning methods advocated for this type tree. The author of this work was not immune to criticism of his "system" and points out at length the failure of the standard or classical system and the success of his. The differences do not appear too great; the end result, in each case, obviously is the production of fruit while the tree is young, and in quantity. M. Lorette points out the simplicity of his system which, in main, would be true, were it not for numerous exceptions cited which call for special treatment.

Little reference is made to understocks, mentioned casually in only one place, probably by virtue of the fact that fruit trees on dwarfing stocks are commonplace in France. But it is, nevertheless, a factor of importance.

The last chapter of the book is by A. H. Lees, M.A. This is a paper presented at the Conference on Apples and Pears, arranged by the Horticultural Society of Great Britain at the Crystal Palace in London in 1934. The pure Lorette system did not work for Mr. Lees but a modified system did. Apparently one must adapt the system to the variety being pruned, its understock, the soil and climate in which it is growing.

EDWIN BECKETT
Berkshire Garden Center

GARDENING THE SMALL PLACE. William H. Clark. 247 pages, with drawings by Helge Sahlin. Little, Brown & Co., Boston, Mass. 1952. $3.

This is one of the most practical books on the subject available and, as the title states, should be of interest and help to the many urbanites who are looking for just such information and recommendation as its pages contain.

It may be that the average beginner on such a project will be a bit alarmed by the many "Do's and Don'ts." However, taken in stride, he will be reassured, as the development shapes up, by the good advice on the several topics presented in as condensed a manner as is possible when trying to cover such a wide field.

Chapters 1 and 2, covering the Planning and Fundamentals, clearly explain points essential to the new home owner. It leads from the earliest building and grading to the more finished plot, at the same time does not attempt to rush the reader into a lot of unnecessary work at the beginning. The advice of fraternizing with the local gardeners, joining garden clubs, and getting to know one's gardening neighbors is about the best advice that can be given. It not only broadens the source of information, but also pays dividends in exchange of ideas, plants, and sometimes tools.

Chapter 3 covers a wide field and the owner of a small plot will not be especially interested in what large trees to grow. However, shrubs, vines, hedges, fruits and berries, foundation planting, and roses are topics on which sooner or later the interested amateur will seek instructive aid.

Flowers in Chapter 4 are very well covered and, while only a few of the better known kinds are listed, the chart giving the height, spacing, and colors to be found in the different varieties are useful to the beginner; also the different charts showing the correct methods of planting and transplanting. The article on bulbous plants is timely; this seems to be a phase of gardening that becomes more popular every year.

The small plot gardener will be working on something more than a small plot, if he tries out all the listed varieties of worthwhile crops mentioned in Chapter 5. The general care while growing, with advice on sprays and dusts for insect and disease control, is covered in considerable detail. A well-planned and productive vegetable garden is a good idea, for it will help to reduce household expenses, and that is important these days.

Chapters 6 and 7 consider various garden phases. Even if the small plot owner does not have ground area large enough to exercise his gardening abilities to the full, his own particular location and terrain may be adaptable to one or the other types suggested under special gardens.

Mr. Clark's final Chapter 8, giving operations month by month, will prove a valuable reference as the amateur advances with his work. Even if recommendations seem matter of fact, they are very important to the successful enjoyment of a garden.

ARTHUR W. KING
Huntington, L. I.

BEAUTIFY YOUR HOME GROUNDS. Peter Rhodes. 90 pages; illustrations by Leo Soretsky; bibliography. Homecraft Publishers (distributed by Garden City Books), New York. 1952. $1.50.

This book is designed primarily for the small property whose owner would not be likely to call upon professional landscape service. The author apparently understands the practical side of landscape work, but he neglects certain important points, to wit, the study of the site with respect to grades, available topsoil, existing trees, etc. Also, in the drawing on page 24, under Chapter 5, the suggested system of paths cuts up the lawn into small, unrelated areas; and Chapter 9 recommends a front terrace for gracious living. It is generally conceded that privacy and real living comfort may be enjoyed, if the terrace is located at the side or rear of the house away from public view. However, these are only differences in opinion, and there is helpful advice to be had from this guide to home beautification.

SUNSET PRUNING HANDBOOK. Roy L. Hudson. 80 pages, illustrated by Robert Blanchard; indexed. Lane Publishing Co., Menlo Park, Calif. 1952. $1.50.

This is another in the series of "Sunset Publications" which is proving to be a good source of information on various aspects of gardening and home care. While the majority are directed to a California audience, the PRUNING HANDBOOK will be found of interest to gardeners elsewhere, for the principles of pruning are the same in one locality as in another.

The author, Roy L. Hudson, Supervisor of San Francisco's Recreation and Park Department, a past president of California Horticultural Society, is a recognized authority in his field. He is responsible for the maintenance of the world-famous Golden Gate Park.

HOW TO GROW AFRICAN VIOLETS. Carolyn K. Rector. 94 pages, illustrated by Robert Blanchard; indexed. Lane Publishing Co., San Francisco, Cal. 1951. $1.35.

From this very concise, informative little book, the amateur and more advanced grower of African violets will gain valuable advice on growing plants from leaf cuttings, on watering, fertilizing, on the proper soil and light conditions.

There are also helpful chapters on Propagation by Division, Growing Plants for Seed, Pots and Containers, Crossing, Breeding and Hybridization, and Growing Plants for Show.

MYRTLE RADTKE
African Violet Society of America

INTRODUCTORY MYCOLOGY. Constantine John Alexopoulos. 482 pages, illustrated (art work by Mrs. Sun Huang Sung), indexed. John Wiley & Sons, New York. 1952. $7.

The relatively few textbooks in general mycology written in the English language and available today for students whose chief interest is to be introduced to the fungi, either fall seriously short of achieving this aim or else go far beyond it. The former leave the student with vague impressions, the latter overwhelm him with detail.

Dr. Alexopoulos takes a middle course with notable success. Since he has written his book "for the student who knows nothing about the fungi," controversial matters such as interpretations of phylogenetic and taxonomic questions are not treated at length, but neither are they glossed over. An adequate list of carefully selected references appears at the close of each of the seventeen chapters, enabling the beginning student to satisfy his curiosity regarding some finer points. A fifteen-page glossary of mycological terms is also included. A noteworthy addition to the text is the presentation of forty life-cycle diagrams of representative genera and species chosen from all the

(Continued on page 65)

NEWS, NOTES and COMMENTS

House Plant Exhibit. The Special Exhibition Committee arranged a very photogenic exhibit of house plants in the Museum Building of The New York Botanical Garden, from January 16 to March 1, 1953.

The plants were effectively displayed in six model windows, representing a modern window, an old-fashioned window, a kitchen window, two bow windows of the Victorian period, and a sixth designated as the cactus and succulent window.

Among the plants in the modern or picture window, draped in Cheney's "Willows" pattern on white ground, were anthurium, *Cattleya Mossiae, Sansevieria chinensis, Dracaena Hookeriana variegata, Scindapsus* Marble Queen, the wax plant or *Hoya carnosa,* and bromeliads *Tillandsia cyanea* and *Vriesia Moreno-Barilletiana,* both in flower.

The old-fashioned window was framed by wooden shutters, painted a pleasing brown, and chintz curtains in provincial floral design. The colors blended harmoniously with pale pink poinsettia, the Christmas begonia, pelargonium "Mme. Salleroi," fairy primrose, cordyline, and Boston fern. *Cordyline terminalis* or Ti plant is a native of tropical Asia and of the islands of the Pacific. In the Hawaiian Islands, its leaves are used for wrapping fish, as fodder, for thatching, and in hula skirts.

The fairy primrose, *Primula malacoides,* from western China, was first made known to science by the missionary, M. l'Abbe Delavay, about 1883; but living plants were not seen in western gardens until George Forrest, the noted plant collector, sent seeds to England in 1908. Today, many distinct varieties of *P. malacoides* are available. It has proved a very satisfactory substitute for *Primula obconica,* because it does not cause dermatitis as *P. obconica* does in some people.

Fringed taffeta valances, side shelves holding bric-a-brac and books, and antique bird cages— one a hand-carved bird cage from China, the other a brass cage from Holland — gave the two bow windows a truly Victorian atmosphere. Plants in these windows included African violets, paperwhite narcissus, begonias Red Compta and Ballet, a white double-flowered variety, *Iresine Herbstii, Ficus pumila, Pelargonium tomentosum* and *echinatum.* The latter is one of the most attractive winter-flowering members of the genus. *Echinatum* means set with prickles and refers to the spines on the stems. *P. tomentosum* has large velvety leaves which emit a strong scent of peppermint when they are slightly bruised.

On painted metal shelves, that extended from one side of the cactus and succulent window to the other, were small specimens of sedums, euphorbias, haworthias, and kalanchoes, while larger specimens stood on the broad window sill. One of the easiest succulents to grow, and one of the most beautiful, is *Kalanchoe tomentosa.* It was introduced to American horticulture as a result of the Humbert-Swingle expedition to Madagascar in 1928. Another interesting plant in this window display was *Graptopetalum paraguayense,* a native of Mexico, which was distributed to members of The New York Botanical Garden several years ago. When grown in full sun and under favorable conditions, this succulent develops large rosettes of beautifully colored foliage.

One of the bow windows in the Victorian manner. Below, old-fashioned window (left), kitchen window (center), and modern window (right).

The Conservatory of The New York Botanical Garden has been closed to the public since the fall of 1952 for alterations and repairs. Here the plants have been moved to one side while the radiant heating system is being installed in one of the houses.

The kitchen window, with lettuce-basket print draperies, contained pots of lavender, myrtle, hop majoram, mint, thyme, parsley, chives, and scented geraniums; also narcissus Soleil D'Or and a hanging wire basket of English ivy for a decorative note.

Attractively planted "gardens in glass bottles," and an educational display of soils, fertilizers, propagating operations, and books on house plants rounded out this interesting exhibition.

Winterthur Museum - Garden Tour. May 1-29 inclusive (except Sundays and Mondays), the azalea gardens are open to public between 10 a.m. and 5 p.m. $1.50 (except Saturdays $2.50) ticket also includes tour of more than twenty major museum rooms under guidance of trained members of the Wilmington Junior League. Luncheon available; proceeds to charity. No reservations required for this special tour.

For admission at other times, and for complete tours of the museum, you need advance reservations, and waiting list is long.

For road directions and information about all tours, write to: H. F. du Pont Winterthur Museum, Winterthur, Del. (Route 52, near Wilmington, Del.)

1953 Williamsburg Garden Symposium. The speakers at the second session of the Symposium, March 18-20, will include T. H. Everett, Horticulturist of The New York Botanical Garden, Mrs. Richardson Wright, Mrs. Camilla Bradley Truax, and P. J. McKenna. Mr. and Mrs. John Roche will conduct a photography demonstration; Mrs. Louise B. Fisher, Supervisor of flower arrangements for Colonial Williamsburg, will give a demonstration of 18th century flower arrangements, and Mrs. Lewis M. Hull, President of the American Horticultural Council, will preside over the garden club discussion.

"Christmas Flower Legends." Being an officer of the F.A.O. Headquarters, I have the pleasure of regularly seeing "The Garden Journal," which is circulated by our library among the staff members who are interested in gardening.

In the November-December 1952 number, I read with interest an article by Dorothy Ebel Hansell about "Christmas Flower Legends." I was particularly interested in her quotation of the old legend about the Christmas Eve Garden of Göinge Forest, as told her by her grandmother.

My special interest in that particular legend is probably due to the fact that I am Danish and, therefore, familiar with the Scandinavian literature. I should like the author of the article to know that the legend was told many years ago by the famous Swedish woman writer, Selma Lagerlof, and is published in several editions in all the Scandinavian countries, together with other legends and fairy tales.

ARNE KJAER
Agricultural Officer
Rome, Italy

"A Little Known Species of Cyclamen." It is with much regret that I am obliged to call attention to an error in the spelling of the specific name *hederaefolium* as *hederifolium* in my recent paper entitled, "A Little Known Species of Cyclamen," which appeared in the September-October 1952 issue of "The Garden Journal." It is hard to understand how I made so obvious a mistake, especially since it is correctly spelled in my personal notes relating to this species and in other papers relating to other species of the genus published in "National Horticultural Magazine" for July 1952, and in the "Journal" of the California Horticultural Society for October 1952.

WALTER C. BLASDALE
Berkeley, California

"The Glastonbury Thorn." I have been carried away by the article on "The Glastonbury Thorn" by Donald P. Rogers and by the poem "Salute to the Trees" by Henry Van Dyke. I have lent my copy of the November-December 1952 issue so often it is quite shabby, and I should appreciate a fresh copy.

As a young girl fifty years ago, I was so fortunate as to visit in Somerset, England, in a very delightful house whose owner had made a hobby of local history. His family had been located in that part of England for many generations.

We were taken some miles to Glastonbury, saw the old round kitchen left from the Abbey, climbed the Tor, actually passed "Wear All Hill," and fairly lived in the time of King Arthur.

Some of the information that Dr. Rogers gives is new to me; some, of course, I had forgotten; but it has been a wonderful refreshment to be carried back to a particularly treasured incident.

JULIA T. EMERSON
Somers, N. Y.

Award to Mrs. Joseph Cudahy. The Charles L. Hutchinson Medal has been presented by the Chicago Horticultural Society to Mrs. Joseph Cudahy, daughter of Joy Morton, founder of the Morton Arboretum. Mrs. Cudahy was chosen for the award because of her service to the Arboretum, her participation in the project to beautify the Lincoln Memorial Garden in Springfield, and her other contributions to horticulture.

Daylily Awards. The Stout medal, the highest award of the Hemerocallis Society, has been given to "Potentate," a pansy-purple variety originated by Mrs. Thomas Nesmith of Lowell, Mass. "Potentate," introduced in 1943, won the Award of Merit in 1950 and ranked second in the Society's 1952 Popularity Poll.

Among ten varieties selected for the Award of Merit were "Georgia" and "Dominion," both originated by Dr. A. B. Stout, Curator Emeritus of The New York Botanical Garden.

Mrs. Richard Fenby Bausman. Mrs. Richard Fenby Bausman died on January 19, 1953, after a brief illness. She had recently moved to Cresskill, N. Y., after long residence in Englewood, N. J. Mrs. Bausman, member of the Corporation and Corresponding Secretary of the Advisory Council of The New York Botanical Garden, was seriously interested in gardening and an active participant in the affairs of the Garden Club of America, the Garden Club of New Jersey, the Great Barrington Garden Club, the Lenox Garden Club, and the Englewood Garden Club. She was also vice-president of the Berkshire (Mass.) Garden Center.

Sarah Havens Harlow. Miss Sarah Havens Harlow died on December 30, 1952, at the age of eighty-four. Miss Harlow, who was graduated from Wellesley College in 1891, taught for a time at the American Collegiate Institute in Turkey. Later, while earning her Master's degree in botany at Columbia University, she was a teacher at a private school in Plainfield, N. J. In 1911 she became assistant librarian, in 1913 librarian of The New York Botanical Garden, a post she filled capably until her retirement in 1938.

Conservation in an Urban Environment. The Staten Island Museum is sponsoring a conference on "Conservation in an Urban Environment" on May 16. The morning session, starting at 10 a.m., will stress the importance of conservation in general and how it involves urban communities and city planning. Three afternoon sessions at 2 o'clock will be devoted to (1) Survival of wildlife; (2) Conservation and the home owner; (3) Conservation education. Among the speakers will be George Peters, Harold Canepi, Charles Mohr and James J. Mallon. The highlight of the day will be a lecture at 8:15 that evening on "Revolution in Conservation" by Louis Bromfield. For further information write to Staten Island Museum, 75 Stuyvesant Place, Staten Island 1, N. Y.

Eighth International Botanical Congress. The Congress will be held in Paris in July 1954. The president will be Professor Roger Heim, Director of the Museum National d'Histoire Naturelle. The General Secretary will be Professor P. Chouard, National Des Arts and Métiers, 292 Rue St. Martin, Paris (3°), France.

Awards for Distinguished Service to Forestry. At the recent joint meeting in Montreal, Canada, of the Society of American Foresters and the Canadian Institute of Forestry, the Gifford Pinchot medal was presented to Raphael Zon of St. Paul, Minn., former editor of the Journal of Forestry and retired director of the Lakes States Forest Experimental Station; the Sir William Schlicht memorial medal was awarded posthumously to the late Ellwood Wilson of Knowlton, Quebec, "the father of aerial forest mapping"; and the plaque annually awarded by the Canadian Forestry Association for outstanding service in forest conservation was presented to Henri Kieffer, chief of the Forest Protection Service of Quebec, Department of Lands and Forest.

Spring Garden Tour. Details of the Spring Garden Tour on May 7 to gardens in Chestnut Hill, Pa., may be had after March 1 at the downtown office of The New York Botanical Garden, 22 East 60th St., New York 22, N. Y.

BOOK REVIEWS **(from page 62)**

major groups. The Deuteromycetes are discussed following the Ascomycetes, emphasis being placed upon the close relationship which exists between many of these fungi.

The author's summary account of the lichens, which occupies only slightly more than a page of text, should be revised to meet the standard of the rest of the book. However, the general excellence of the work makes it an important contribution to the field of elementary mycology. The book is written in a lucid style not likely to be misinterpreted, the illustrations are well chosen and well reproduced, and the subject matter authoritatively treated.

BERNARD LOWY
Department of Botany
Louisiana State University

MANUAL OF PHYCOLOGY. An Introduction to the Algae and their Biology. Edited by Gilbert M. Smith. 375 pages, illustrated; indexed. Chronica Botanica, Waltham, Mass.; Stechert-Hafner, Inc., New York City. 1951. $7.50.

Every student and teacher of algae should find this MANUAL OF PHYCOLOGY both stimulating and helpful. Sixteen specialists have cooperated with the editor in summarizing information to the date of writing, in indicating important gaps in our present knowledge of algae, and in outlining methods of attack upon these problems. Each chapter is followed by an extensive bibliography. In the preface, the editor expresses regret that few research papers published since 1949 could be covered in the discussions, owing to the time lag between reception of the manuscripts and publication. This is perhaps the only fault in the book. There is a remarkable lack of repetition in the various chapters and only minor inconsistencies in the use of terms (such as homothallic and monoecious) by the different authors. The book is well illustrated with plates, text figures, and tables.

The editor has contributed the discussion of the classification of algae, outlining the characteristic features of seven divisions which are discussed more fully, by as many algologists, in the succeeding seven chapters. The first half of the book deals chiefly with structure, classification, and life histories. It is valuable because it has been so condensed and brought up to date by recognized authorities, whose opinions on controversial points are of great interest. Apart from this, the material is probably more familiar to most botanists than is that in the later chapters.

The second half of the book is concerned with more specialized information about algae. There is a short chapter on fossil algae by J. H. Johnson, including a table showing the age distribution of known fossil algae and a discussion of calcareous algae as rock builders. H. C. Bold has contributed a chapter on cytology. Smith's chapter on sexuality of algae includes a considerable discussion of the work of Moewus and others on sexual substances and relative sexuality in the *Chlamydomonas eugametos* group. There are two chapters dealing with the difficult subject of the ecology of algae. L. H. Tiffany, writing of freshwater forms, points out that attention must be directed more and more to their micro-environments. Jean Feldmann, whose contribution on the ecology of marine algae was translated from the French by Maxwell S. Doty, also urges that the observed facts must be explained and discusses work done along these lines. Chapters on the pigments of algae by Strain, the physiology and biochemistry of algae by Blinks, and the biology of plankton by Ketchum are thorough and relevant in this connection.

In Appendix A, Pringsheim has outlined those methods for cultivation and isolation of algae, which he has found most dependable in his own experiments. A second appendix, by Johansen, contains expert advice on microtechnique.

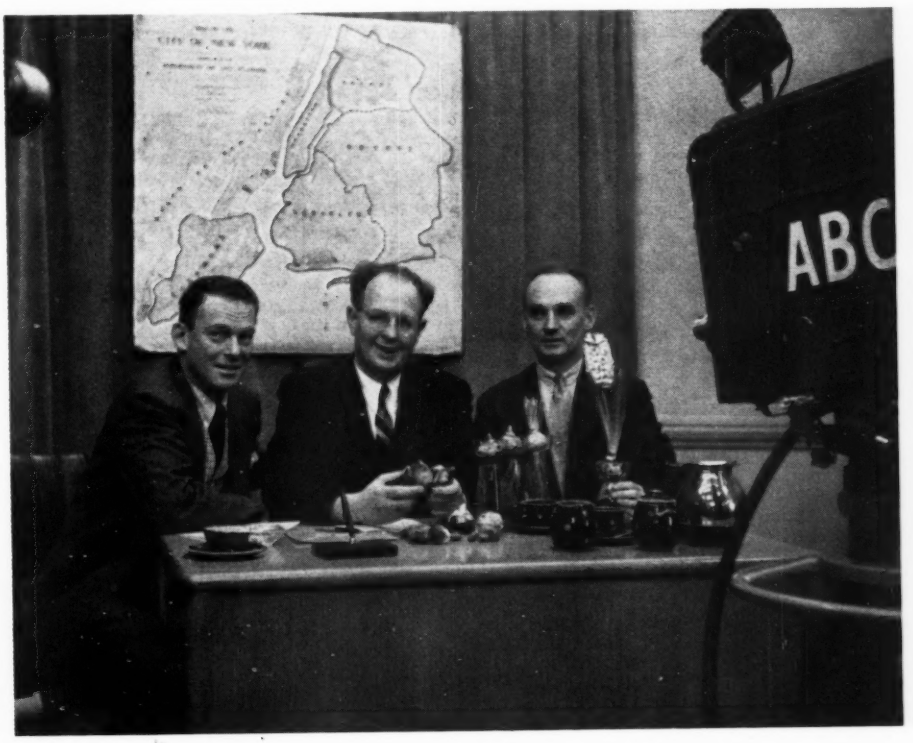
New work should be inspired and aided by this convenient and comprehensive volume.

JENNIE L. S. SIMPSON
Hunter College
New York City

FOREST ENTOMOLOGY. Samuel Alexander Graham. 351 pages, illustrations, bibliography, index. McGraw-Hill, New York. Third Edition. 1952. $6.

Dr. Graham's new book, a revision of his PRINCIPLES OF FOREST ENTOMOLOGY, is not a manual for the field identification of forest insects. It is rather an outline of the relation of insects to forests and the methods of forest protection. As such, it presents an account of the ecology, population dynamics, methods of investigation, and control of the most important types of forest insect pests.

The book is organized into sections on history, bionomics, control methods, and the groups of insects which cause the various types of injury. The present edition has a new chapter on insect surveys, and the information on chemical control methods



On January 12, 1953, over the television show, "Second Cup of Coffee," T. H. Everett, Horticulturist of The New York Botanical Garden, showed hosts Marc Cramer (left) and Eric Rhodes (right) the fine points of Dutch bulbs and the stages of growth of hyacinths. On the same program, on January 26, 1953, Marc Cramer and Eric Rhodes televised the house plant exhibit of The New York Botanical Garden.

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and materials has been brought up to date. Details of forestry practice and the economics of control operations are considered throughout.

As the book is intended as a text for the training of foresters, the reader is not given an account of the classification, morphology, or systematics of insects. However, there are many good sources of information on these subjects, and the book is held to a reasonable size by their omission.

The bibliography is adequate, the printing good, and the illustrations much improved in quality over those of previous editions. Used in conjunction with a book such as Craighead's INSECT ENEMIES OF EASTERN FORESTS, which provides keys for the identification of forest insects, FOREST ENTOMOLOGY is probably the best modern textbook on the subject.

W. R. HENSON
Forest Insect Laboratory
Sault Ste. Marie, Ont.

THE SCIENTISTS LOOK AT OUR WORLD. Wm. V. Houston, W. Albert Noyes, Jr., Curt Stern, Alan Gregg, Wendell H. Camp. Edited by John M. Fogg, Jr. 147 pages. University of Pennsylvania Press, Philadelphia, Pa. 1952. $3.

In inviting these five notable scientists — a physicist, a chemist, a geneticist, a medical scientist, and a botanist — to deliver the 1951 Series of Benjamin Franklin Lectures, the University of Pennsylvania requested that each discuss and evaluate the advances in his discipline in recent years, and touch upon the interdependence of the several fields and their impact on present and future generations.

The presentation of these five lectures in book form makes it possible for those who were unable to listen to the delivery of these lectures, to enjoy the penetrating analysis of techniques and trends in these several fields and their relation to the other fields of science. Of particular interest are "Genetics Today" by Dr. Stern and "Plant Sciences in the World Today" by Dr. Camp.

UNDERSTANDING HEREDITY. An Introduction to Genetics. Richard B. Goldschmidt. 228 pages, illustrated, indexed. John Wiley, New York. 1952. $3.75.

The author, who is Professor Emeritus of Zoology at the University of California, is credited with the discovery of many basic facts in genetics, cytology, and evolution. In this volume, presented as a "genetics primer" for those without a scientific background, Dr. Goldschmidt establishes what is and what is not inherited, then explains the nature of visible inheritable traits and the structures within cells that control these traits. He also discusses mutation and some of the more advanced problems of genetics in a way which the non-scientific mind can grasp.

A CHILD'S BOOK OF INSECTS. Sy Barlowe. 30 pages, illustrated. Maxton Publishers, New York. 1952. 59¢.

The book brings together a simple text, giving a factual account of some thirty insects, and a series of lively and mostly accurate colored and black-and-white illustrations. Suitable as an introduction to insects for a child — kindergarten to eighth grade — who knows nothing of them.

DONALD P. ROGERS

TREES OF THE WEST. Elizabeth Chapman Willier. 29 pages, illustrated by Barry Martin. Pageant Press, New York. 1952. $1.50.

This book presents studies of six of the more unusual trees of the Pacific Coast. The author, a frequent contributor to young people's magazines, and winner of literary awards for her articles on historical subjects, has a deep affection for trees and a true appreciation of their beauty.

THANKS TO TREES. Irma E. Webber. 60 pages, illustrated. Wm. R. Scott, Inc., New York. 1952. $2.

The story of the use and conservation of trees is presented in such a way that it is closely related to a youngster's own experience. The text is set in easy-to-read type in short paragraphs, and each page contains an explanatory sketch (nearly all are in color) that is quickly grasped by the young reader.

PLAY WITH LEAVES AND FLOWERS. Millicent E. Selsam. 64 pages, illustrated by Fred E. Scherer. Wm. Morrow & Co., New York. 1952. $2.

This book describes interesting plant movements and what causes them. It covers such plants as clover, honey locust, sundew, Venus flytrap, witch-hazel, touch-me-not, the obedient plant, and the sensitive plant. In each case, the plant movement is quick and decided enough to hold a child's interest. The prime purpose of the book is to develop the young reader's power of observation and, through experiments he can conduct himself, to make him aware of the plant world around him. This it does admirably. The line drawings which accompany the text are helpful.

GIFTS FROM THE FOREST. Gertrude Wallace Wall. 96 pages, illustrated with photographs by John Calvin Towsley. Charles Scribner's Sons, New York. 1952. $2.50.

Step by step, the operations of a large lumber company are explained, from the selection and cutting of trees to the machinery that makes logs into lumber. The text is detailed and, at the same time, clear and interesting for both children and adults. However, as the author states, "photography is of the essence of this book," and she gives full credit to John C. Towsley for the significant collection of pictures which depict the various operations accurately and with a wealth of detail.

WHAT'S INSIDE OF PLANTS? Herbert S. Zim. 32 pages, illustrated by Herschel Wartik. Wm. Morrow & Co., New York. 1952. $1.75.

Children should like this book. It was designed for parents and their youngsters to enjoy together. Some of the pages are in simple words, in large type, the child can read himself; others should be read aloud by an adult. Clear, colorful drawings complement the text, which explains the different parts of plants and shows how they grow.

from the HERB SHELF

The root of licorice yields a substance glycyrrhizin which is fifty times as sweet as sugar. However, most licorice candies made in this country are flavored with anise. Extract of licorice is added to tobacco products to give mellowness and preserve moisture. It is also used to mask the bitter taste of medicines. From the extraction process comes a fire-fighting foam and the spent root is converted into a tough and insulating wallboard. Such are the results of modern research in a very old industry. From the days of the Pharaohs, licorice root has been mixed with water to produce a drink known as *mai sus,* which is still popular in Egypt. No need to import coca cola! Licorice enabled ancient warriors to go for twelve days without drink.

Readers of "The Garden Journal" may be interested in "The Story of Licorice," a booklet obtainable free of charge from MacAndrews and Forbes Company, 200 Fifth Avenue, New York 10, N. Y.

While licorice would thrive in this country only in Florida or California, as it likes a climate suitable for orange trees, herb

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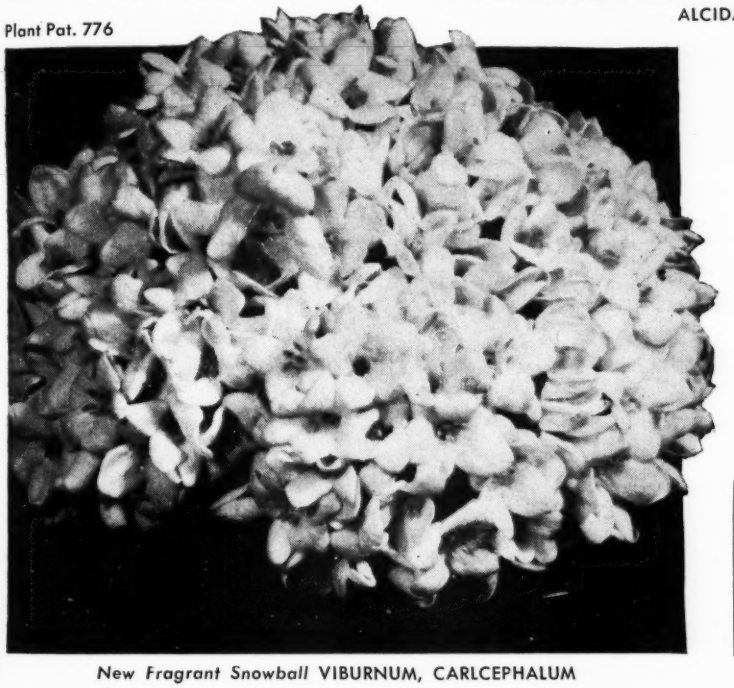

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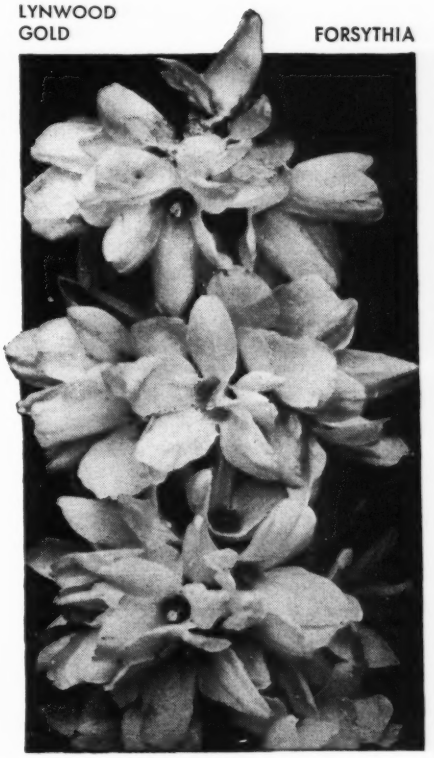

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Wayside Gardens

gardeners have a wide choice of licorice or anise-tasting plants. Though usually associated with confections, this particular tang goes well with fish. Tarragon, fennel, chervil, and sweet cicely are licorice-like in flavor; when added to fish, any one of them takes away the strong sea-food taste. Perhaps it is the masking quality of this essence which renders fish mild and meat-like. Tarragon was chewed by the Arabs in olden times to numb their taste buds before taking strong medicine. It is the treasure of chefs, who call it estragon, and the most prized herb in the culinary garden.

French tarragon is a clon, best propagated by root divisions made early in the spring of the third year. The slow-growing serpentine roots are very brittle and resent transplanting, except when nearly dormant in late March or early April.

In making tarragon vinegar, the leaves and succulent stems are cut before the fourth of July. After hot weather sets in, the stalks become woody, the leaves tough and sparser. If side dressed with potato fertilizer in spring and after cutting, the plants will yield a second harvest before frost. In November the stems are cut back to the ground and mulched with garden soil. Tarragon is winter hardy but sometimes heaves out of the ground in early thaws. It needs good drainage. Fertilizing and dividing every third year keep the brittle roots from exhausting themselves.

Fennel has a distinctly anise-like savor, which is welcome in sauce for mackerel and other baked fish. It can be grown from seed. The five-foot tall, feathery-looking plants are perennial. A form known as bronze fennel is very decorative.

Chervil, a dainty little plant with much-divided leaves, is used like tarragon in salads, fish dishes, and omelets. Seeds must be fresh to get a good stand of chervil, which will reseed itself in loamy soil where it gets partial shade.

Larger and more decorative, sweet cicely is sometimes called giant chervil. The flavor is more pronounced, the leaves larger and slightly hairy. This quality does not interfere with its value in cooking, if the leaves are chopped fine or dried before adding to food. The white umbelliferous flowers of cicely are lovely in the shady garden in May, while the ferny foliage is effective all through the season.

LOBSTER ASPIC SALAD

¾ c. milk
1 egg, beaten
2 tbs. melted butter
¼ tbs. salt
1 tbs. dried tarragon
⅔ tbs. sugar
2 tbs. flour
2 tbs. gelatin, softened in ¼ c. white wine
1 can consomme
½ c. minced celery
¼ c. tarragon vinegar
1 tbs. chopped parsley
½ tsp. paprika
1 c. whipped cream
1 can of lobster meat

Beat egg with milk and melted butter, adding vinegar slowly. Add to sifted flour, sugar, salt, and seasonings. Place in a double boiler with gelatin and cook till thick. When cool, fold in consomme, whipped cream, lobster broken in small pieces, and celery. Place in a fish mold. Chill and turn onto a bed of watercress and lettuce.

GERTRUDE B. FOSTER

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Flora of the Prairies, and Plains of Central North America, by P. A. Rydberg. 969 pages and 601 figures. 1932. $6.

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